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U-SYS SoftX3000 SoftSwitch System

Operation Manual – Configuration Examples

V300R003

U-SYS SoftX3000 SoftSwitch System

Operation Manual

Volume	Configuration Examples
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About This Manual

Related Manuals

The related manuals are listed in the following table.

Manual	Content
U-SYS SoftX3000 SoftSwitch System Technical Manual-System Description	It provides an overall introduction to the SoftX3000, including product features, applications, and technical specifications.
U-SYS SoftX3000 SoftSwitch System Technical Manual-System Principle	It details on the hardware architecture, component interworking mechanism, and subsystems of alarm, billing, and clock in the SoftX3000.
U-SYS SoftX3000 SoftSwitch System Hardware Description Manual	It details the features and technical specifications of the hardware components of the SoftX3000, including cabinets, frames, boards, cables, and cabinet internal components.
U-SYS SoftX3000 SoftSwitch System Technical Manual–Services and Features	It covers various services and functions supported by the SoftX3000, including voice services, supplementary services, IP Centrex services, multi-media services, value added services, dual homing functions, charging functions, IPTN functions, remote network access functions, and so on.
U-SYS SoftX3000 SoftSwitch System Hardware Installation Manual	It details the installation procedure of the SoftX3000 hardware components, and matters needing attention during the installation process.
U-SYS SoftX3000 SoftSwitch System Software Installation Manual	It covers the detailed procedure of installing the SoftX3000 software, including BAM server, emergency workstation, and client, focusing on the key points that might cause installation failure.
U-SYS SoftX3000 SoftSwitch System Routine Maintenance Guide	It guides the maintenance engineers to perform daily maintenance, monthly maintenance, and yearly maintenance tasks on the SoftX3000.

Manual	Content
U-SYS SoftX3000 SoftSwitch System Emergency Maintenance Manual	It guides the maintenance engineers to perform recovery operations in the case of emergencies, such as congestion of global service, AMG, and TMG, and failure of host and BAM.
U-SYS SoftX3000 SoftSwitch System Part Replacement Guide	It guides the maintenance engineers on how to replace hardware components of the SoftX3000, such as boards, fan frame, LAN Switch, and hard disk.
U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Guide	It guides the engineers how to configure various data in the SoftX3000, including configuration steps, preparations, database table referencing relationships, and command parameters.
U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Examples	It guides the engineers how to configure various data in the SoftX3000, including networking example, configuration script, key parameters and debugging guidance.
U-SYS SoftX3000 SoftSwitch System Operation Manual-Performance Measurement	It guides the engineers how to work on performance measurement tasks and analyze measurement results.
U-SYS SoftX3000 SoftSwitch System Operation Manual-GUI Guide	It guides the engineers how to use the GUI on various clients of the SoftX3000, including operations on menus and navigation tree. In addition, it introduces the operations on TableBrowse.
U-SYS SoftX3000 SoftSwitch System BAM User Manual	It guides the engineers how to install and use the software related to the BAM, including remote maintenance software, anti-virus software, system customized software, and so on.
U-SYS iGateway Bill User Manual	It elaborates on the functioning principle of the iGateway Bill. Also, it teaches you on how to install, maintain, and operate the product.

Organization

The manual provides some typical configuration examples to illustrate how to configure data in SoftX3000.

- **Chapter 1 Subscriber Access Networking** introduces the data configuration steps and commissioning guideline for SoftX3000 to interconnect with IAD, AMG, UMG, V5 access network, SIP terminal, H.323 terminal, U-Path, and UniPhone.

- **Chapter 2 Trunk Signaling Networking** provides the data configuration steps and commissioning guideline for SoftX3000 to interwork with SoftSwitch, PSTN switch, and traditional H.323 network.

- **Chapter 3 MRS Related Configurations** details the data configuration steps and commissioning guideline for SoftX3000 to interconnect with embedded MRS and physically separate MRS (MRS6000).
- **Chapter 4 Service Related Configurations** focuses on Centrex services, IP supermarket services, videoconferencing services, IN services, and IPN services.
- **Chapter 5 Specialized Configurations** describes the application backgrounds and configuration steps regarding clock, charge, number analysis, and call barring.
- **Chapter 6 Special Applications** provides configuration steps about multi-signaling-point-code function, multi-area-code function, hybrid application of public and private networks, and emergency call prefixes.
- **Appendix A Configuration of Subscriber Terminals** introduces how to set multimedia terminal parameters such as VIZUFON terminal and PINGTEL terminal.
- **Appendix B Acronyms and Abbreviations** collects frequently used acronyms and abbreviations as well as their full names in this manual.

Intended Audience

The manual is intended for the following readers:

- NGN engineering specialist
- NGN operation & maintenance personnel
- NGN network planning experts

Conventions

The manual uses the following conventions:

I. General conventions

Convention	Description
Arial	Normal paragraphs are in Arial.
Boldface	Headings are in **Boldface**.
Courier New	Terminal Display is in Courier New.

II. Command conventions

Convention	Description
Boldface	The keywords of a command line are in **Boldface**.

Convention	Description
italic	Command arguments are in *italic*.
[ ]	Items (keywords or arguments) in square brackets [ ] are optional.
{ x	y	... }	Alternative items are grouped in braces and separated by vertical bars. One is selected.
[x	y	...]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
{ x	y	... } *	Alternative items are grouped in braces and separated by vertical bars. A minimum of one or a maximum of all can be selected.
[x	y	...] *	Optional alternative items are grouped in square brackets and separated by vertical bars. Many or none can be selected.
#	A line starting with the # sign is comments.

III. GUI conventions

Convention	Description
< >	Button names are inside angle brackets. For example, click the <OK> button.
[ ]	Window names, menu items, data table and field names are inside square brackets. For example, pop up the [New User] window.
/	Multi-level menus are separated by forward slashes. For example, [File/Create/Folder].

IV. Keyboard operation

Format	Description
<Key>	Press the key with the key name inside angle brackets. For example, <Enter>, <Tab>, <Backspace>, or <A>.
<Key1+Key2>	Press the keys concurrently. For example, <Ctrl+Alt+A> means the three keys should be pressed concurrently.
<Key1, Key2>	Press the keys in turn. For example, <Alt, A> means the two keys should be pressed in turn.

V. Mouse operation

Action	Description
Select	Press and hold the primary mouse button (left mouse button by default).
Click	Select and release the primary mouse button without moving the pointer.
Double-Click	Press the primary mouse button twice continuously and quickly without moving the pointer.
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

VI. Symbols

Eye-catching symbols are also used in the manual to highlight the points worthy of special attention during the operation. They are defined as follows:

⚠ **Caution:** Means reader be extremely careful during the operation.

📖 **Note:** Means a complementary description.

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Chapter 1 Subscriber Access Networking

1.1 Configuring Basic Data

To configure subscriber access data, make sure that the necessary basic data, including equipment data, local office data and charging data has already been configured. For the convenience of description, all of the configuration examples mentioned in this chapter involve the same basic data.

1.1.1 Data Planning

I. Equipment data

1) Equipment configuration

In this example, SoftX3000 is only configured with one basic frame, which is located at frame position 2 in the integrated configuration cabinet. Figure 1-1 shows its configuration.
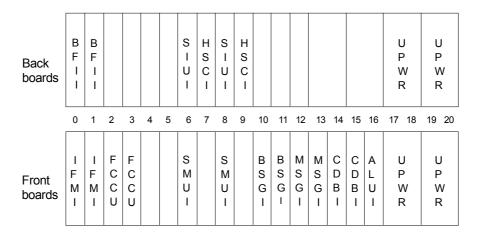
Figure 1-1 SoftX3000 equipment configuration

2) Board information

Table 1-1 Basic information of major boards

Frame No. / Slot No.	Position	Board	Active/standby	Module No.
0 / 0	Front	IFMI	Active	132
0 / 1	Front	IFMI	Standby	132
0 / 2	Front	FCCU	Active	22

Frame No. / Slot No.	Position	Board	Active/standby	Module No.
0 / 3	Front	FCCU	Standby	22
0 / 10	Front	BSGI	Active	136
0 / 11	Front	BSGI	Work independently	137
0 / 12	Front	MSGI	Work independently	211
0 / 13	Front	MSGI	Standby	211
0 / 14	Front	CDBI	Active	102
0 / 15	Front	CDBI	Standby	102

IFMI: IP Forward Module   FCCU: Fixed Calling Control Unit

BSGI: Broadband Signaling Gateway   MSGI: Multimedia Signaling Gateway Unit

CDBI: Central Database Board

3)   Fast Ethernet (FE) port IP address

The IP address of FE port is 191.169.150.30/255.255.0.0.

II. Local office data

- The Signaling Point Code (SPC) of the local office is the national network SPC 001122.
- The local DN set 0 reveals that nation code is 86 and national toll area code is 755.
- Number segment 1 includes numbers from 6540000 to 6540999.
- Number segment 2 includes numbers from 8780000 to 8780999.

III. Charging data

- Charging case 10: Meter table 1 is used. The system counts twice the meter for the first 180 seconds, and then counts once every 60 seconds. In this charging case, there is no discount for any charging duration.
- Charging case 20: Meter table 2 is used. The system counts twice the meter for the first 60 seconds, and then counts once every 60 seconds. In this charging case, there is no discount for any charging duration.
- In this example, the charging is performed in intra-office group charging mode, as shown in Table 1-2.

Table 1-2 Intra-office group charging mode

Calling relationship	Caller charging source code	Callee charging source code	Changing case
Subscribers in number segment 1 call each other.	65	65	10
Subscribers in number segment 2 call each other.	87	87	10

Calling relationship	Caller charging source code	Callee charging source code	Changing case
Subscriber in number segment 1 calls subscriber in number segment 2.	65	87	20
Subscriber in number segment 2 calls subscriber in number segment 1.	87	65	20

📕 **Note:**

As shown in Table 1-2, the first two charging modes are used for the calls in the same serving area, and the last two are for the calls between serving areas.

1.1.2 Script

I. Getting offline

//Get offline.

```
LOF:;
```

//Set alarm switch to "Off".

```
SET CWSON: SWT=OFF;
```

//Set format conversion switch to "OFF".

```
SET FMT: STS=OFF;
```

II. Configuring equipment data

//Add rack with rack number as 0.

```
ADD SHF: SN=0, LT="SZ-SoftX3000", PN=0, RN=0, CN=0, PL=2;
```

📕 **Note:**

Because the integrated cabinet is configured with only one basic frame in this example, and the position number of the basic frame is 2, the parameter "PDB location" in the command can be set only to 2, that is, the basic frame controls the power distribution box (PDB).

//Add frame with numbered 0 in position 2.

```
ADD FRM: FN=0, SN=0, PN=2;
```

 Note:

For the basic frame in the integrated configuration cabinet, it is fixed that its frame number is 0 and position number in the rack is 2.

//Add board, with auxiliary board in adjacent slot.

```
ADD BRD: FN=0, SN=0, LOC=FRONT, BT=IFMI, MN=132, ASS=1;
ADD BRD: FN=0, SN=2, LOC=FRONT, BT=FCCU, MN=22, ASS=3;
ADD BRD: FN=0, SN=10, LOC=FRONT, BT=BSGI, MN=136, ASS=255;
ADD BRD: FN=0, SN=11, LOC=FRONT, BT=BSGI, MN=137, ASS=255;
ADD BRD: FN=0, SN=12, LOC=FRONT, BT=MSGI, MN=137, ASS=13;
ADD BRD: FN=0, SN=14, LOC=FRONT, BT=CDBI, MN=102, ASS=15;
```

 Note:

1) The BSGIs are configured to work in load sharing mode generally, that is, one module number is configured for one board, so the parameter "assistant slot number" in the command must be set to 255.

2) SoftX3000 also supports the BSGIs to work in active and standby mode. However, the BSGIs do not support Q.931 protocol (call processing adaptation module) and they need not save the information of the established calls, so it is unnecessary to configure them to work in active and standby mode. To enhance the resource utilization rate of the equipment, it is recommended to set the BSGIs to work in load sharing mode.

3) The module number configuration of each board is suggested as follows:

- The module number of the SMUI: from 2 to 21 in ascending order.
- The module number of the FCCU: from 22 to 101 in ascending order.
- The module number of the UCSI: from 101 to 22 in descending order.
- The module number of the CDBI: from 102 to 131 in ascending order.
- The module number of the IFMI: from 132 to 135 in ascending order.
- The module number of the BSGI: from 136 to 211 in ascending order.
- The module number of the MSGI: from 211 to 136 in descending order.
- The module Number of the MRCA: from 212 to 247 in ascending order.

//Add configuration information of IFMI FE port, whose default gateway address is the IP address of the router.

```
ADD       FECFG:       MN=132,IP="191.169.150.30",       MSK="255.255.0.0",
DGW="191.169.150.60", EA=AUTO;
```

📖 **Note:**

The IP address of the default router (gateway) of the FE port must be set correctly;
otherwise, SoftX3000 cannot communicate with IP devices.

//Add all central database functions.

```
ADD CDBFUNC: CDPM=102,
FCF=LOC-1&TK-1&MGWR-1&BWLIST-1&IPN-1&DISP-1&SPDNC-1&RACF-1&PRESEL-1&UC-1&K
S-1;
```

📖 **Note:**

If the system is configured with two pairs of CDBI boards, allocate database functions
to these two groups of CDBI boards according to load sharing rule. If the system is
configured with only one pair of CDBI boards, allocate all database functions to it.

III. Configuring local office data

//Set local office information with local SPC as 001122 (national network).

```
SET OFI: OFN="SZSX", LOT=CMPX, NN=YES, SN1=NAT, SN2=NAT, SN3=NAT, SN4=NAT,
NPC="001122", NNS=SP24, SPF=YES;
```

//Add local DN set 0, with nation code as 86 and national toll area code as 755.

```
ADD LDNSET: LP=0, NC=K'86, AC=K'755, LDN="ShenZhen";
```

//Add call source. Call source code 0 is for ordinary subscriber, and the number of
pre-received digits is 3. Call source code 1 is for Centrex subscriber, and the number of
pre-received digits is 1.

```
ADD CALLSRC: CSC=0, CSCNAME="Normal", PRDN=3;
ADD CALLSRC: CSC=1, CSCNAME="Centrex", PRDN=1;
```

 Note:

- For common subscribers, the number of pre-received digits is set to 3 generally. For Centrex subscribers, the number of pre-received digits is set to 1 usually. A Centrex subscriber (ESL subscriber or V5 subscriber) can hear the secondary dial tone after dialing the outgoing prefix.
- Set the subscriber call source code as 0–49, and the trunk call source code as 50–99 to separate the subscriber call source code from the trunk call source code. For pure tandem exchange, the call source code can start from 0.

//Add number segment.

```
ADD DNSEG: LP=0, SDN=K'6540000, EDN=K'6540999;
ADD DNSEG: LP=0, SDN=K'8780000, EDN=K'8780999;
```

IV. Configuring charging data

//Add charging cases 0, 10 and 20. Charging case 0 uses call detail record (CDR) in destination code charging mode, and charging cases 10 and 20 use meter table in intra-office group charging mode.

```
ADD CHGANA: CHA=0, CHGT=DETAIL;
ADD CHGANA: CHA=10, CHGT=PLSACC, MID=METER1;
ADD CHGANA: CHA=20, CHGT=PLSACC, MID=METER2;
```

//Modify charging mode.

```
MOD CHGMODE: CHA=0, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=0, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=0, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
MOD CHGMODE: CHA=10, DAT=NORMAL, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=10, DAT=DTYPE1, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=10, DAT=DTYPE2, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=20, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

```
MOD CHGMODE: CHA=20, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=20, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
```

🕮 **Note:**

- By default, Monday to Thursday are recognized as normal workdays, Friday Category 1 and Saturday and Sunday Category 2.
- If only one time zone is to be defined, set the time zone 1 switch point and time zone 2 switch point to "00:00", and adopt the metering mode and discount of time zone 1.

//Add intra-office group charging.

```
ADD CHGGRP: RCHS=65, DCHS=65, LOAD=ALL, CODEC=ALL, CHA=10;

ADD CHGGRP: RCHS=87, DCHS=87, LOAD=ALL, CODEC=ALL, CHA=10;

ADD CHGGRP: RCHS=65, DCHS=87, LOAD=ALL, CODEC=ALL, CHA=20;

ADD CHGGRP: RCHS=87, DCHS=65, LOAD=ALL, CODEC=ALL, CHA=20;
```

//Add charging case index. The caller charging source code 88 is used for destination code charging of the incoming trunk group. The caller charging source code 89 is used for destination code charging of the outgoing trunk group.

```
ADD CHGIDX: CHSC=0, RCHS=88, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;

ADD CHGIDX: CHSC=0, RCHS=99, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
```

V. Converting data format and getting online

//Set format conversion switch to "ON".

```
SET FMT: STS=ON;
```

//Convert data format.

```
FMT:;
```

//Set alarm switch to "ON".

```
SET CWSON: SWT=ON;
```

//Get online.

```
LON:;
```

1.1.3 Commissioning Guideline

I. Restarting frame

Because the frame is controlled by two power switches, it is possible to perform wrong operation (to power off BAM or iGWB). In this case, pull out the two SMUI boards after the frame is powered on and reinsert them to restart the frame.

II. Checking whether the loading is successful

1)   Board running state

Start the client program "U-SYS SoftX3000 Client", and expand [System Navigator/Device Management/Device Management] on the [Management] tab to check the running states of the boards in the frame, as shown in Figure 1-2.
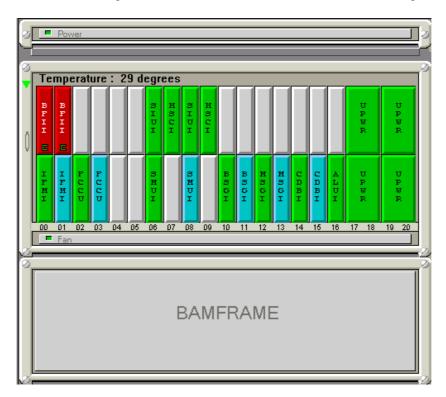
Figure 1-2 Running status of boards in the frame

As shown in Figure 1-2, the upper part shows the running states of the back boards, and the lower part displays the running states of the front boards. In SoftX3000, different colors stand for different running states, described as follows.

- Green: The board is running normally, and it is the active one.
- Blue: The board is running normally, and it is the standby one.
- Red: The board is faulty.
- Grey: The slot is not configured with any board.

2)   Version information

If all boards run normally, the following check is to see whether the software versions of the boards are consistent with those described in the version configuration table. Execute the **DSP BVER** command on the U-SYS SoftX3000 Client to list the software versions of the boards.

If the software version of a board is not correct, use the **LST LSS** command to check whether the loading switch of the board is correct, that is, whether the status is "Program unavailable, data unavailable". If not, use **MOD LSS** to modify the software switch to this status, and reset the board to make it reloaded.

3)   Cyclic Redundancy Check (CRC) for board data

Run the **STR CRC** command on the U-SYS SoftX3000 Client to perform CRC to the data of a board. If CRC fails, reset the board to make it reloaded.

1.2 Configuring Data for Interconnecting with IAD (through MGCP)

1.2.1 Introduction

I. Typical networking model

When an Integrated Access Device (IAD) accesses SoftX3000 through IP Metropolitan Area Network (MAN), it is mainly applied to provide small-capacity analog subscriber line ports, so that operators can provide voice service to disperse subscribers through IP MAN. Generally, an IAD provides less than 48 ports. Figure 1-3 illustrates the typical networking model when an IAD adopts Media Gateway Control Protocol (MGCP) to interconnect with SoftX3000.
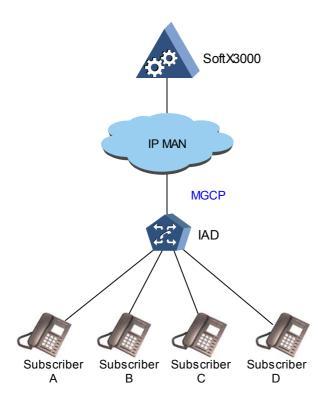
Figure 1-3 IAD adopting MGCP to access SoftX3000

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- All the subscribers have registered with the Caller ID Display (CID) service.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at IAD side about the following parameters as shown in Table 1-3.

Table 1-3 Parameters for SoftX3000 interconnecting with IAD

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and IAD	MGCP
2	MGCP code type	ABNF (text format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of IAD	211.169.150.1/255.255.0.0
5	Domain name of IAD	Shenzhen-iad104-01.com

Serial No.	Parameter	Value
6	Local UDP port number of MGCP at SoftX3000 side	2727
7	Local UDP port number of MGCP at IAD side	2427
8	Interface name of IAD	aaln
9	Numbering plan of termination ID (subscriber port) of IAD	Starting from 0
10	Speech codecs supported by IAD	G.711A, G.711μ, G.723.1, G.729A
11	Whether IAD supports hairpin connection	Not supported
12	Whether IAD supports Echo Cancellation (EC) function	Supported
13	Whether IAD supports the detection of Fax and Modem signal tone	Supported
14	Whether IAD supports T.38 protocol	Not supported
15	Phone number of subscriber A (whose termination ID is 0)	6540000
16	Phone number of subscriber A (whose termination ID is 1)	6540001
17	Phone number of subscriber B (whose termination ID is 2)	6540002
18	Phone number of subscriber C (whose termination ID is 3)	6540003

1.2.2 Script

I. Configuring MG data

//Add an IAD adopting MGCP, with equipment ID as "shenzhen-iad104-01.com".

```
ADD MGW: EID="shenzhen-iad104-01.com", GWTP=IAD, MGWDESC="iad104-01",
MGCMODULENO=22, PTYPE=MGCP, LA="191.169.150.30", RA1="211.169.150.1",
RP=2427, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1, UCATT=NOFX-0&NOM-0;
```

 Note:

- When the IAD adopts MGCP, the format of "Equipment ID" in the command is domain name. It is recommended to set the domain name of the media gateway in the way of "site name-MG type-number". Make sure the configuration is consistent with that of the gateway side. Here the equipment ID is "shenzhen-iad104-01.com".

- When a media gateway is IAD, SoftX3000 will not instruct it to detect the Fax and Modem signal tone of a terminal by default. In this case, if it is needed to use a fax machine or Modem, set the parameter "special attributes" in the command correctly. Note that "NOFX-0" indicates to detect fax signal tone..

- If the IAD adopts dynamic IP address, the parameter "dynamic IP" in this command must be set to "Support". In this case, the value of the parameter "remote address1" can be any valid value.

- When the gateway is an AG or an IAD, the default value of "TDM termination ID prefix index" is 2, indicating that the TDM termination ID (that is, the interface name) is the default value, "aaln/".

II. Configuring subscriber data

//Add four ESL subscribers. Set "equipment ID" to "shenzhen-iad104-01.com" and "FCCU/FCSU module number" to 22 for all four subscribers.

```
ADD VSBR: D=K'6540000, LP=0, MN=22, DID=ESL, EID="shenzhen-iad104-01.com",
TID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540001, LP=0, MN=22, DID=ESL, EID="shenzhen-iad104-01.com",
TID=1, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540002, LP=0, MN=22, DID=ESL, EID="shenzhen-iad104-01.com",
TID=2, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540003, LP=0, MN=22, DID=ESL, EID="shenzhen-iad104-01.com",
TID=3, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
```

 Note:

- For the IADs from different manufacturers, the individual numbering plans for the termination ID of subscriber port are different. In this example, the number starts from 0.

- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter NS (console supplementary service) in this command.

III. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

  Note:

- Configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.2.3 Commissioning Guideline

After completing the above configurations, the operator can verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the IAD is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the IAD has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether the IAD has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that the IAD has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that the IAD has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the IAD has been modified.
- If "Fault" is displayed, it indicates the IAD cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing service by making a call

If the IAD is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise, the operator can

- Execute the **DSP EPST** command to check whether the terminals of the IAD have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.
- Check whether the data configuration at IAD side is correct if the data at SoftX3000 side is configured correctly.

1.3 Configuring Data for Interconnecting with IAD (through H.248 Protocol)

1.3.1 Introduction

I. Typical networking model

When an IAD accesses SoftX3000 through IP MAN, it is mainly applied to provide small-capacity analog subscriber line ports, so that operators can provide voice service to disperse subscribers through IP MAN. Generally, an IAD provides less than 48 ports. Figure 1-4 illustrates the typical networking model when an IAD adopts H.248 protocol to interconnect with SoftX3000.
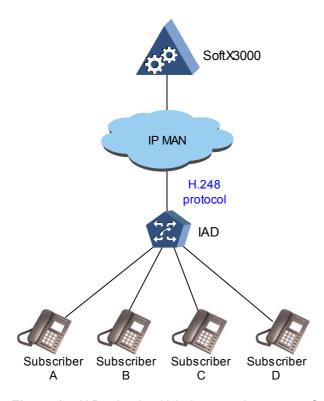
Figure 1-4 IAD adopting H.248 protocol to access SoftX3000

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- The subscribers all can register the CID function.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at IAD side about the following parameters as shown in Table 1-4.

Table 1-4 Parameters for SoftX3000 interconnecting with IAD

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and IAD	H.248 protocol
2	H.248 coding type	ABNF (text format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of IAD	211.169.150.2/255.255.0.0
5	Local UDP port number of H.248 at SoftX3000 side	2944
6	Local UDP port number of H.248 at IAD side	2944
7	Numbering plan of termination ID (subscriber port) of IAD	Starting from 0
8	Speech codecs supported by IAD	G.711A, G.711µ, G.723.1, G.729A
9	Whether IAD supports hairpin connection	Not supported
10	Whether IAD supports EC function	Supported
11	Whether IAD supports to detection of Fax and Modem signal tone	Supported
12	Whether IAD supports T.38 protocol	Not supported
13	Phone number of subscriber A (whose termination ID is 0)	6540010
14	Phone number of subscriber A (whose termination ID is 1)	6540011
15	Phone number of subscriber B (whose termination ID is 2)	6540012
16	Phone number of subscriber C (whose termination ID is 3)	6540013

1.3.2 Script

I. Configuring MG data

//Add an IAD adopting H.248 protocol, with equipment ID as 211.169.150.2:2944.

```
ADD MGW: EID="211.169.150.2:2944", GWTP=IAD, MGWDESC="shenzhen-iad132-01",
MGCMODULENO=22,  PTYPE=H248,  LA="191.169.150.30",  RA1="211.169.150.2",
RP=2944, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1, UCATT=NOFX-0&NOM-0;
```

 Note:

- When the IAD adopts H.248 protocol, the format of the parameter "equipment ID" in the command is "IP address: Port number". Here the equipment ID is "191.169.150.25:2944".
- When a media gateway is IAD, SoftX3000 will not instruct it to detect the Fax and Modem signal tone of a terminal by default. In this case, if it is need to use a fax machine or Modem, set the parameter "special attributes" in the command correctly. Noted that "NOFX-0" indicates to detect fax signal tone.
- If the IAD adopts dynamic IP address, the parameter "dynamic IP" in this command must be set to "Support". In this case, the value of the parameter "remote address1" can be any valid value.

II. Configuring subscriber data

//Add four ESL subscribers. Set "Equipment ID" to "211.169.150.2:2944" and "FCCU/FCSU module number" to "22".

```
ADD VSBR: D=K'6540010, LP=0, MN=22, DID=ESL, EID="211.169.150.2:2944", TID=0,
CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540011, LP=0, MN=22, DID=ESL, EID="211.169.150.2:2944", TID=1,
CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540012, LP=0, MN=22, DID=ESL, EID="211.169.150.2:2944", TID=2,
CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540013, LP=0, MN=22, DID=ESL, EID="211.169.150.2:2944", TID=3,
CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
```

📖 **Note:**

- For the IADs from different manufacturers, the individual numbering plans for the termination ID of subscriber port are different. Some IADs may start the termination ID of its subscriber port from 0. In this example, the termination ID starts from 1.
- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

III. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

📖 **Note:**

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.3.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the IAD is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the IAD has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether the IAD has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that the IAD has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that the IAD has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the IAD has been modified.
- If "Fault" is displayed, it indicates the IAD cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing service by making a call

If the IAD is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

- Execute the **DSP EPST** command to check whether the terminals of the IAD have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.
- Check whether the data configuration at IAD side is correct if the data at SoftX3000 side is configured correctly.

1.4 Configuring Data for Interconnecting with IAD (through H.323 Protocol)

1.4.1 Introduction

I. Typical networking model

When an IAD accesses SoftX3000 through IP MAN, it is mainly applied to provide small-capacity analog subscriber line ports, so that operators can provide voice service to disperse subscribers through IP MAN. Generally, an IAD provides less than 48 ports. Figure 1-5 illustrates the typical networking model when an IAD adopts H.323 protocol to interconnect with SoftX3000.

Figure 1-5 IAD adopting H.323 protocol to access SoftX3000

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- The subscribers all can register the CID function.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at H.323 IAD side about the following parameters as shown in Table 1-5.

Table 1-5 Parameters for SoftX3000 interconnecting with IAD

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and IAD	H.323 protocol
2	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
3	Registration/authentication mode of H.323 gateway (IAD)	Based on gateway ID
4	Equipment ID of H.323 gateway (IAD)	shenzhen–H323IAD29–01
5	Registration password of H.323 gateway (IAD)	123456

Serial No.	Parameter	Value
6	Registration, Admission and Status (RAS) port number	1719
7	Numbering plan of termination ID (subscriber port) of IAD	Starting from 0
8	Phone number (Termination ID) of subscriber A	6540020
9	Phone number (Termination ID) of subscriber B	6540021
10	Phone number (Termination ID) of subscriber C	6540022
11	Phone number (Termination ID) of subscriber D	6540023

1.4.2 Script

Because H.323 protocol data is public data, it is unnecessary to configure it here if it has been configured.

I. Configuring H.323 protocol data

//Add system configuration of H.323 protocol, with the system name as "SoftX3000".

```
ADD H323SYS: SYSNM="SoftX3000";
```

 Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GateKeeper (GK), GateWay (GW) or Multipoint Control Unit (MCU) in the H.323 network..

//Add application layer configuration of H.323 protocol. The number of Transmission Control Protocol (TCP) port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

☐ **Note:**

- Because the system is configured with one MSGI, the parameter "MSG module type" in the command must be set to "RAS & CALL".
- For detailed information about the port number configuration principle, see related contents in Chapter 7, "Configuring Protocol Data", in *U-SYS SoftX3000 SoftSwitch System Operation Manual Configuration Guide.*
- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Configuring MG data

//Add an IAD adopting H.323 protocol, with equipment ID as shenzhen-H323IAD29-01 and registration password as 123456.

```
ADD   MMTE:   EID="shenzhen-H323IAD29-01",   MN=22,   PT=H323,   DT=H323IAD,
PASS="123456", AT=ABE,CONFIRM=Y;
```

☐ **Note:**

- When the IAD adopts H.323 protocol, the parameters "equipment ID" and "Registration password" in the command must be consistent with those of the H.323 gateway (IAD); otherwise, IAD cannot be registered in SoftX3000 successfully. In addition, it is recommended to set the equipment ID in the way of "office name-MG type-number".
- The parameter DT(Device type) in the command must be set to "H323IAD", which is different from that set in H.323 terminal.

III. Configuring subscriber data

//Add four H.323 subscribers. Set equipment ID to "shenzhen-H323IAD29-01" for all four subscribers.

```
ADD MSBR: D=K'6540020, LP=0, EID="shenzhen-H323IAD29-01", TID=K'6540020,
RCHS=65, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'6540021, LP=0, EID="shenzhen-H323IAD29-01", TID=K'6540021,
RCHS=65, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'6540022, LP=0, EID="shenzhen-H323IAD29-01", TID=K'6540022,
RCHS=65, CSC=0, NS=CLIP-1;
```

```
ADD MSBR: D=K'6540023, LP=0, EID="shenzhen-H323IAD29-01", TID=K'6540023,
RCHS=65, CSC=0, NS=CLIP-1;
```

 Note:

- Currently, when SoftX3000 is interconnected with H.323 IAD of Huawei Technologies, a subscriber's termination ID must be the E.164 number (phone number) of the subscriber. Otherwise, the subscriber cannot be registered in SoftX3000.
- If you want to enable the CID function for H.323 subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

IV. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

 Note:

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.4.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the IAD is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the IAD has been registered normally

Execute the **DSP EPST** command on the U-SYS SoftX3000 Client to see whether the IAD has been registered normally, and then decide the next steps according to the returned result.

- If "Register" is returned, it indicates that the IAD has been registered and its data configuration is correct.
- If "UnRegister" is displayed, it indicates the H.323 terminal cannot be registered. In this case, use the **LST MMTE** command to check whether the parameters, such as equipment ID and registration/authentication type, are correctly configured.

III. Testing service by making a call

If the IAD is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise, check whether the parameters at IAD side are configured correctly.

1.5 Configuring Data for Interconnection with MTA (through NCS Protocol)

1.5.1 Introduction

I. Typical networking model

Media Terminal Adapter (MTA) is an access equipment loaded with Network-Based Call Signaling (NCS) protocol (developed and extended from MGCP), functioning in accessing the data, voice and video services to the IP packet network through cable network.

There are two kinds of MTA:

- SMTA (connected with cable modem through network cable).
- EMTA (built in cable modem).

In actual application, EMTA is adopted generally, as shown in Figure 1-6.
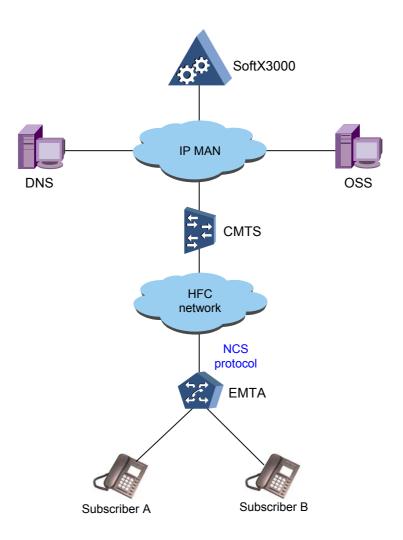
Figure 1-6 MTA adopting NCS protocol to access SoftX3000

Due to the feature of access to SoftX3000 through cable, to enable common telephones to access the IP MAN through EMTA, the carrier must configure cable modem Terminal System (CMTS), Domain Name Server (DNS) and Operating Support System (OSS) for networking, as shown in Figure 1-6. When searching the call agent (SoftX3000), EMTA can resolve the DNS domain name of the call agent to obtain its IP address.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) The subscribers can call each other.
2) All the subscribers have registered with the Caller ID Display (CID) service.

III. Inerconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at MTA side about the following parameters as shown in Table 1-6.

Table 1-6 Parameters for SoftX3000 interconnecting with MTA

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and MTA	NCS protocol
2	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
3	IP address of MTA	211.169.150.3/255.255.0.0
4	Domain name of MTA	Shenzhen-mta003-01.com
5	Local UDP port number of NCS protocol at SoftX3000 side	2727
6	Local UDP port number of NCS protocol at MTA side	2427
7	Interface name of MTA	aaln
8	Numbering plan of termination ID (subscriber port) of MTA	Starting from 1
9	Speech codecs supported by MTA	G.711A, G.711μ, G.723.1 and G.729A
10	Whether MTA supports hairpin connection	Not supported
11	Whether MTA supports EC function	Supported
12	Whether MTA supports the detection of Fax and Modem signal tone	Supported
13	Whether MTA supports T.38 protocol	Not supported
14	Phone number of subscriber A (whose termination ID is 1)	6540201
15	Phone number of subscriber B (whose termination ID is 2)	6540202

1.5.2 Script

I. Configuring MG data

//Add an MTA adopting NCS, with equipment ID as "shenzhen-mta003-01.com".

```
ADD   MGW:  EID="shenzhen-mta003-01.com",  GWTP=MTA,  MGWDESC="mta003-01",
MGCMODULENO=22,    PTYPE=MGCP,   LA="191.169.150.30",   RA1="211.169.150.3",
RP=2427, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1, UCATT=NOFX-0&NOM-0;
```

 Note:

- NCS protocol is based on the MGCP, so if the media gateway is an MTA, the parameter "protocol type" in the command must be set to "MGCP", and the parameter "equipment ID" should be "shenzhen-mta003-01.com" (in domain name format). It is recommended to set the domain name in the way of "office name- MG type-number".
- When the gateway is an AG or an IAD, the default value of "TDM termination ID prefix index" is 2, indicating that the TDM termination ID (that is, the interface name) is the default value, "aaln/".

II. Configuring subscriber data

//Add two ESL subscribers. Set "Equipment ID" to "shenzhen-mta003-01.com" and "FCCU/FCSU module number" to "22" for both subscribers.

```
ADD VSBR: D=K'6540201, LP=0, MN=22, DID=ESL, EID="shenzhen-mta003-01.com",
TID=1, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540202, LP=0, MN=22, DID=ESL, EID="shenzhen-mta003-01.com",
TID=2, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
```

 Note:

- For the MTAs from different manufacturers, the individual numbering plans for the termination ID of subscriber port are different. In this example, the termination ID starts from 1.
- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

III. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

📖 **Note:**

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.5.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the MTA is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the MTA has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether the MTA has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that the MTA has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that the MTA has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the MTA has been modified.
- If "Fault" is displayed, it indicates the MTA cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing service by making a call

If the MTA is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

1) Use the **DSP EPST** command to check whether the terminals of the MTA have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.

2) Check whether the data configuration at MTA side is correct if the data at SoftX3000 side is configured correctly.

1.6 Configuring Data for Interconnecting with AMG (through MGCP)

1.6.1 Introduction

I. Typical networking model

When an Access Media Gateway (AMG) accesses SoftX3000 through IP MAN, it is mainly applied to provide medium-capacity analog subscriber line ports, so that operators can provide voice service to enterprise subscribers through IP MAN. For example, Huawei AMG5160 can provide up to 160 ports. Figure 1-7 illustrates the typical networking model when an AMG adopts MGCP to interconnect with SoftX3000.
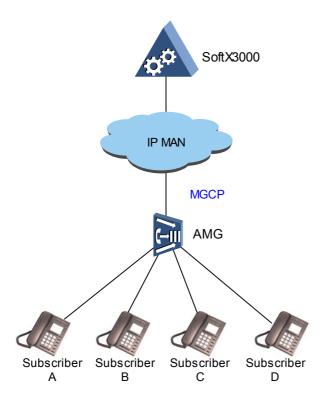
Figure 1-7 AMG adopting MGCP to access SoftX3000

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- The subscribers all can register the CID function.

- The internal users of AMG can exchange call information through hairpin connection.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at AMG side about the following parameters as shown in Table 1-7.

Table 1-7 Parameters for SoftX3000 interconnecting with AMG

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and AMG	MGCP
2	MGCP code type	ABNF
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of AMG	211.169.150.5/255.255.0.0
5	Domain name of AMG	Shenzhen-amg5160-01.com
6	Local UDP port number of MGCP at SoftX3000 side	2727
7	Local UDP port number of MGCP at AMG side	2427
8	Interface name of AMG	aaln
9	Numbering plan of termination ID (subscriber port) of AMG	Starting from 0
10	Speech codecs supported by AMG	G.711A, G.711µ, G.723.1, G.729A
11	Whether AMG supports hairpin connection	Not supported
12	Whether AMG supports EC function	Supported
13	Whether AMG supports the detection of Fax and Modem signal tone	Supported
14	Whether AMG supports T.38 protocol	Supported
15	Phone number of subscriber A (whose termination ID is 0)	6540030
16	Phone number of subscriber B (whose termination ID is 1)	6540031
17	Phone number of subscriber C (whose termination ID is 2)	6540032
18	Phone number of subscriber D (whose termination ID is 3)	6540033

1.6.2 Script

I. Configuring MG data

//Add an AMG adopting MGCP, with equipment ID as "shenzhen-amg5160-01.com".

```
ADD          MGW:           EID="shenzhen-amg5160-01.com",          GWTP=AG,
MGWDESC="shenzhen-amg5160-01",         MGCMODULENO=22,          PTYPE=MGCP,
LA="191.169.150.30",             RA1="211.169.150.5",             RP=2427,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,             HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1;
```

📖 **Note:**

- When the AMG adopts MGCP, the format of "Equipment ID" in the command is domain name. It is recommended to set the domain name in the way of "office name-MG type-number" Here the equipment ID is "shenzhen-amg5160-01.com".
- Because the AMG in this example does not support hairpin connection, the **HAIRPIN** "hair pin connection" in this command must be set as "**Not Supported**", otherwise, the internal communication of the AMG will be abnormal.
- When the gateway is an AG or an IAD, the default value of "TDM termination ID prefix index" is 2, indicating that the TDM termination ID (that is, the interface name) is the default value, "aaln/".

II. Configuring subscriber data

//Add four ESL subscribers, with the start subscriber number as 6540030, the end subscriber number as 6540033.

```
ADB   VSBR:   SD=K'6540030,   ED=K'6540033,   LP=0,   MN=22,   DID=ESL,
EID="shenzhen-amg5160-01.com",   STID=0,   CODEC=PCMA,   RCHS=65,   CSC=0,
NS=CLIP-1;
```

📕 **Note:**

- For AMG, it is generally required to add a large number of subscribers. To improve the efficiency, use the batch command **ADB VSBR**.
- For the AMGs from different manufacturers, the individual numbering plans for the termination ID of subscriber port are different. Some AMGs may start the termination ID of its subscriber port from 1. In this example, the termination ID starts from 0.
- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

III. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

📕 **Note:**

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.6.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the AMG is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the AMG has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether the AMG has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that the AMG has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that the AMG has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the AMG has been modified.
- If "Fault" is displayed, it indicates the AMG cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing service by making a call

If the AMG is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

- Use the **DSP EPST** command to check whether the terminals of the AMG have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.
- Check whether the data configuration at AMG side is correct if the data at SoftX3000 side is configured correctly.

1.7 Configuring Data for Interconnecting with AMG (through H.248 Protocol)

1.7.1 Introduction

I. Typical networking model

When an AMG accesses SoftX3000 through IP MAN, it is mainly applied to provide medium-capacity analog subscriber line ports, so that operators can provide voice service to enterprise subscribers through IP MAN. For example, Huawei AMG5320 can provide up to 320 ports. Figure 1-8 illustrates the typical networking model when an AMG adopts H.248 protocol to interconnect with SoftX3000.
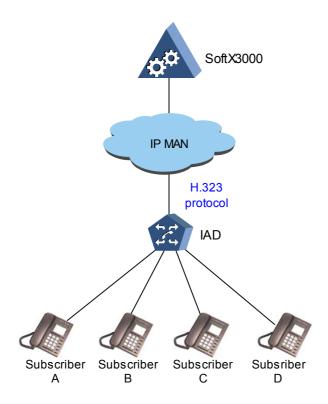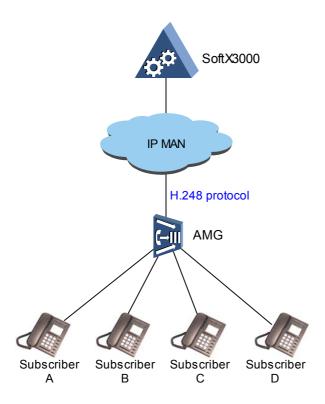
Figure 1-8 AMG adopting H.248 protocol to access SoftX3000

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- The subscribers all can register the CID function.
- The internal users of AMG can exchange call information through hairpin connection.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, you need to negotiate with the maintenance personnel at AMG side about the following parameters as shown in Table 1-8.

Table 1-8 Parameters for SoftX3000 interconnecting with AMG

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and AMG	H.248 protocol
2	H.248 coding type	ABNF (text format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of AMG	211.169.150.6/255.255.0.0

Serial No.	Parameter	Value
5	Local UDP port number of H.248 at SoftX3000 side	2944
6	Local UDP port number of H.248 at AMG side	2944
7	Numbering plan of termination ID (subscriber port) of AMG	Starting from 0
8	Speech codecs supported by AMG	G.711A, G.711μ, G.723.1, G.729A
9	Whether AMG supports hairpin connection	Not supported
10	Whether AMG supports EC function	Supported
11	Whether AMG supports the detection of Fax and Modem signal tones	Supported
12	Whether AMG supports T.38 protocol	Supported
13	Phone number of subscriber A (whose termination ID is 0)	6540050
14	Phone number of subscriber B (whose termination ID is 1)	6540051
15	Phone number of subscriber C (whose termination ID is 2)	6540052
16	Phone number of subscriber D (whose termination ID is 3)	6540053

1.7.2 Script

I. Configuring MG data

//Add an AMG adopting H.248 protocol, with equipment ID as "211.169.150.6:2944".

```
ADD MGW: EID="211.169.150.6:2944", GWTP=AG, MGWDESC="shenzhen-amg5320-01",
MGCMODULENO=22, PTYPE=H248, LA="191.169.150.30", RA1="211.169.150.6",
RP=2944, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1;
```

📖 **Note:**

- When the AMG adopts H.248 protocol, the format of the parameter "equipment ID" in the command is "IP address: Port number". Here the equipment ID is "211.169.150.2:2944".
- Because the AMG in this example does not support hairpin connection, the parameter **HARIPIN** "hair pin connection" in this command must be set as "**Not Supported**". Otherwise, the internal communication of the AMG will be abnormal.

II. Configuring subscriber data

//Add four ESL subscribers. The start number is 6540050 , and the end number is 6540053.

```
ADB   VSBR:   SD=K'6540050,   ED=K'6540053,   LP=0,   MN=22,   DID=ESL,
EID="211.169.150.6:2944", STID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
```

📖 **Note:**

- For AMG, it is generally required to add a large number of subscribers. To improve the efficiency, use the batch command **ADB VSBR.**
- For the AMGs from different manufacturers, the individual numbering plans for the termination ID of subscriber port are different. Some AMGs may start the termination ID of its subscriber port from 1. In this example, the termination ID starts from 0.
- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

III. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

📖 **Note:**

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.7.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and AMG is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the AMG has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether the AMG has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that the AMG has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that the AMG has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the AMG has been modified.
- If "Fault" is displayed, it indicates the AMG cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing service by making a call

If the AMG is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

- Use the **DSP EPST** command to check whether the terminals of the AMG have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.

- Check whether the data configuration at AMG side is correct if the data at SoftX3000 side is configured correctly.

1.8 Configuring Data for Interconnecting with UMG8900 (Connected with RSP Subscriber Frame Device)

1.8.1 Introduction

I. Typical networking model

When a UMG8900 serves as AMG, it can access Huawei RSP subscriber frame device through E1 and provide large-capacity analog or digital subscriber line ports, so that operators can provide voice service and narrowband data service to subscribers through IP WAN. Figure 1-9 illustrates the typical networking model of UMG8900 serving as AMG (connected with RSP subscriber frame device).
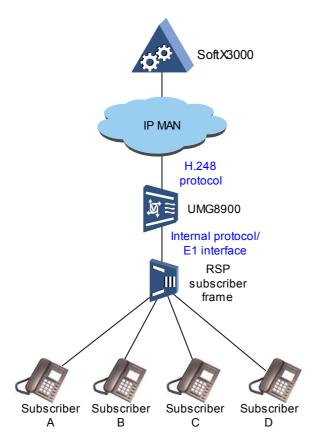
Figure 1-9 UMG8900 AMG connected with RSP subscriber frame device

In the networking mode as shown in Figure 1-9, RSP subscriber frame is invisible for SoftX3000. That is, when you configure data at SoftX3000 side, it is only required to take UMG8900 and RSP subscriber frame as one AMG adopting H.248 protocol.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- Two IUA links are used between SoftX3000 and UMG8900 for bearing DSS1 signaling services in load sharing mode.
- Subscribers A and B are ESL subscribers and each is allocated with one number. Subscribers C and D are ISDN (2B+D) subscribers and each is allocated with two numbers.
- The subscribers can call each other.
- The subscribers all can register the CID function.
- The internal users of UMG8900 can exchange call information through hairpin connection.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at UMG8900 side about the following parameters as shown in Table 1-9

Table 1-9 Parameters for SoftX3000 interconnecting with UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248 protocol
2	H.248 coding type	ASN.1 (binary mode)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	H.248 IP address of UMG8900	211.169.150.7/255.255.0.0
5	SIGTRAN IP address of UMG8900	211.169.150.8/255.255.0.0
6	Local UDP port number of H.248 at SoftX3000 side	2944
7	Local UDP port number of H.248 at UMG8900 side	2944
8	Numbering plan of termination ID (RSP subscriber port) of UMG8900	Starting from 0
9	Speech codecs supported by UMG8900	G.711A, G.711μ, G.723.1, G.729A
10	Whether UMG8900 supports hairpin connection	Supported
11	Whether UMG8900 supports EC function	Supported
12	Whether UMG8900 supports the detection of Fax and Modem signal tones	Supported

Serial No.	Parameter	Value
13	Whether UMG8900 supports T.38 protocol	Supported
14	Local SCTP port number of IUA links at SoftX3000 side (Client)	IUA link 0: 9900 IUA link 1: 9901
15	Local SCTP port number of IUA link at UMG8900 side (Server)	9900
16	Transmission mode of IUA links between SoftX3000 and UMG8900	Load sharing mode
17	Phone number of ESL subscriber A (whose termination ID is 0)	6540060
18	Phone number of ESL subscriber B (whose termination ID is 1)	6540061
19	Phone number of ISDN subscriber C (whose termination ID is 16)	6540062, 6540063
20	Phone number of ISDN subscriber D (whose termination ID is 18)	6540064, 6540065
21	Interface ID of BRA link of ISDN subscriber C	12345
22	Interface ID of BRA link of ISDN subscriber D	54321

1.8.2 Script

I. Configuring MG data

//Add a UMG8900, with equipment ID as "211.169.150.7:2944". It supports hairpin connection.

```
ADD MGW: EID="211.169.150.7:2944", GWTP=UMGW, MGWDESC="shenzhen-UMG8900-01",
MGCMODULENO=22, LA="191.169.150.30", RA1="211.169.150.7", RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

📕 **Note:**

- For UMG8900, no matter whether it serves as AG or TG, the format of the parameter "equipment ID" in this command must be "IP address: Port number", and "Gateway Type" must be "UMGW".
- You must set "Remote IP address 1" to the IP address of the UMG8900 for H.248, that is, 211.169.150.7.
- Because H.248 protocol of UMG8900 only supports binary mode, the parameter "code type" in this command must be "ASN.1".
- You must set "hairpin connection" to "Supported" because UMG8900 supports the hairpin connection function.
- Because UMG8900 supports EC, Fax and Modem functions, the default values are adopted for the options "EC", "No Fax" and "No Modem" in the parameters "EC" and "special attributes".

II. Configuring ESL subscriber data

//Add two ESL subscribers. The start number is 6540060, and the end number is 6540061.

```
ADB   VSBR:   SD=K'6540060,   ED=K'6540061,   LP=0,   MN=22,   DID=ESL,
EID="211.169.150.7:2944", STID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
```

📕 **Note:**

- If it is required to add a large number of subscribers in UMG8900, use the batch command **ADB VSBR**, which can improve the efficiency.
- Each ESL subscriber has only one termination ID, so the subscriber number step is 1 when you set the termination IDs for multiple ESL subscribers continuously.
- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

III. Configuring IUA Data

//Add a built-in SG (in UMG8900), with SG ID as 1.

```
ADD ESG: SGID=1, SGNAME="IUA SG", EID="211.169.150.7:2944";
```

📖 **Note:**

Because it is an SG built in UMG8900, the parameter "SG ID" in the command must be set as the equipment ID of UMG8900, that is, 211.169.150.7:2944.

//Add an IUA linkset, with linkset index as 1, device type as BRA, FCCU module number as 22.

```
ADD IUALKS: LSX=1, LSNAME="IUA LinkSet 1", TM=LOADSHARE, DT=BRA, MN=22,
SGID=1;
```

📖 **Note:**

- Unless otherwise specified, the traffic mode of the linkset should be set to "Load-share".
- The traffic mode of the linkset must be the same as that of the SG; otherwise, all IUA links of the linkset cannot work normally.

//Add two IUA links, with SoftX3000 as the Client, local port number of link 0 of module 136 as 9900, local SCTP port of link 0 of module 137 as 9901, and peer SCTP port number as 9900 (default value).

```
ADD IUALNK: MN=136, LNKN=0, LSX=1, LOCPORT=9900, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.8";
ADD IUALNK: MN=137, LNKN=0, LSX=1, LOCPORT=9901, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.8";
```

📖 **Note:**

- The parameter "Peer port" in the command must be the IP address of UMG8900 for SIGTRAN protocol, that is, 211.169.150.8.
- To ensure the reliability of the IUA links, allocate the two IUA links to different BSGIs (if the system is configured with two BSGIs). In this example, one link is configured to module 136, and the other to module 137.

IV. Configuring ISDN (2B+D) subscriber data

//Add ISDN data, with ISDN index as 1 and Maximum B channel as 2.

```
ADD ISDNDAT: ISDNX=1, BCHN=2;
```

📖 **Note:**

For BRA subscribers, the parameter "maximum B channel" must be set to 2.

//Add two BRA subscribers (default subscribers).

```
ADD BRA: D=K'6540062, LP=0, DID=BRA, EID="211.169.150.7:2944", TID=16, LKS=1,
IID=12345, CODEC=PCMA, RCHS=65, CSC=0, UTP=NRM, AUT=NRM, NS=CLIP-1, CGF=NO,
ISDN=1, ISA=MSN-1, CHT=PRDC;
ADD BRA: D=K'6540064, LP=0, DID=BRA, EID="211.169.150.7:2944", TID=18, LKS=1,
IID=54321, CODEC=PCMA, RCHS=65, CSC=0, UTP=NRM, AUT=NRM, NS=CLIP-1, CGF=NO,
ISDN=1, ISA=MSN-1, CHT=PRDC;
```

📖 **Note:**

- Each BRA subscriber has two termination IDs: If the termination ID typed is "n", the termination IDs occupied by this BRA subscriber will be "n" and "n+1". In this case, when configuring the terminations IDs for multiple BRA subscribers continuously, the number step length must be set to 2.
- For the BRA subscribers using one IUA linkset for carrying D-channel signaling messages, their interface IDs in the IUA linkset cannot be the same. When a lot of BRA subscribers are required in SoftX3000, it is needed to set the interface IDs for BRA links correctly.
- To enable the CID function for the BRA subscribers, set the parameter "supplementary service" in the command to "CLIP".
- To enable the Multiple Subscriber Number (MSN) function for BRA subscribers, set the parameter "ISDN features" in the command to "Multi-subscriber number".

//Add MSN for BRA subscribers.

```
ADD MSN: OD=K'6540062, ND=K'6540063, LP=0, CGF=NO;
ADD MSN: OD=K'6540064, ND=K'6540065, LP=0, CGF=NO;
```

V. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

 Note:

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.8.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and UMG8900 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether UMG8900 has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether UMG8900 has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that UMG8900 has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that UMG8900 has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and UMG8900 has been modified.
- If "Fault" is displayed, it indicates the UMG8900 cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether IUA links are normal

Execute the command **DSP IUALNK** on the U-SYS SoftX3000 Client to check whether the IUA links are in normal status. If they are abnormal, use the command **LST IUALKS** to check whether the traffic mode of the linkset is set correctly, and then use the

command **LST IUALNK** to check whether such parameters as local port number, local IP address, peer port number and peer IP address are configured correctly.

IV. Testing service by making a call

If UMG8900 is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

- Use the **DSP EPST** command to check whether the terminals of UMG8900 have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID and termination ID are configured correctly for ESL subscribers and use the command **LST BRA** to check whether the equipment ID, termination ID and interface ID are configured correctly for ISDN subscribers.
- Check whether the data configuration at UMG8900 side is correct if the data at SoftX3000 side is configured correctly.

1.9 Configuring Data for Interconnecting with UMG8900 (Connected with V5 AN Device)

1.9.1 Introduction

I. Typical networking model

When a UMG8900 serves as AMG, it can access the standard V5 AN device through E1 and provide large-capacity analog or digital subscriber line ports, so that operators can provide voice service to subscribers through IP WAN. Figure 1-10 illustrates the typical networking model of UMG8900 serving as AMG (connected with V5 AN device).
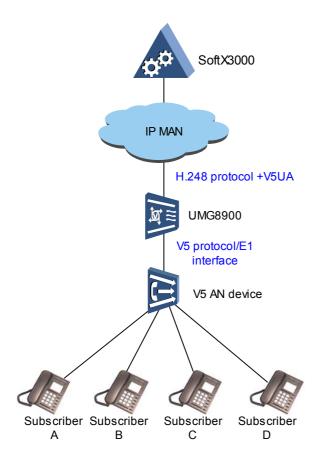
Figure 1-10 UMG8900 AMG connected with V5 AN device

In the networking model as shown in Figure 1-10, SoftX3000 provides V5UA link to connect with UMG8900 and exchange V5 signaling with V5 AN device through the UMG8900 (with embedded SG functions). Besides, SoftX3000 controls UMG8900 to convert voice media streams. In this case, you need to configure the following data at SoftX3000 to make SoftX3000 interconnected with UMG8900 (connected to V5 AN device).

- Data for interconnection between SoftX3000 and UMG8900 (with embedded SG functions),
- Data for interconnection between SoftX3000 and V5 AN device.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two E1 channels (that is, two V5 links) are enabled between SoftX3000 and V5 AN device through UMG8900.

2) Two V5UA links are used between SoftX3000 and UMG8900 for bearing V5 signaling services in load sharing mode.

3) Subscribers A and B are ESL subscribers and each is allocated with one number. Subscribers C and D are ISDN (2B+D) subscribers and each is allocated with two numbers.

4) The V5 subscribers can call each other.

5) The subscribers all can register the CID function.

6) The internal users of UMG8900 can exchange call information through hairpin connection.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate with the maintenance personnel at UMG8900 side and V5 AN device side about the following parameters as shown in Table 1-10 and Table 1-11.

Table 1-10 Parameters for SoftX3000 interconnecting with UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248 protocol
2	H.248 coding type	ASN.1 (binary mode)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of H.248 protocol in UMG8900	211.169.150.9/255.255.0.0
5	IP address of SIGTRAN protocol in UMG8900	211.169.150.10/255.255.0.0
6	Local UDP port number of H.248 at SoftX3000 side	2944
7	Local UDP port number of H.248 at UMG8900 side	2944
8	Speech codecs supported by UMG8900	G.711A, G.711μ, G.723.1, G.729A
9	Whether UMG8900 supports hairpin connection	Supported
10	Whether UMG8900 supports EC function	Supported
11	Whether UMG8900 supports the detection of Fax and Modem signal tone	Supported
12	Whether UMG8900 supports T.38 protocol	Supported
13	E1 numbering plan at UMG8900 side	Starting from 0
14	Numbering plan of termination ID (E1 timeslot) of UMG8900	Starting from 0

Serial No.	Parameter	Value
15	V5 trunk group E1 number at SoftX3000 side	0~1
16	E1 link ID at UMG8900 side corresponding to V5 trunk group	0~1
17	Local SCTP port number of V5UA link at SoftX3000 side (Client)	V5UA link 0: 5675 V5UA link 1: 5676
18	Local SCTP port number of V5UA link at UMG8900 side (Server)	5675
19	Transmission mode of V5UA link between SoftX3000 and UMG8900	Load sharing mode

Table 1-11 Parameters for SoftX3000 interconnecting with V5 AN device

Serial No.	Parameter	Value
1	V5 interface type	V5.2 interface
2	V5 interface ID	5678
3	V5 link ID of start E1	15
4	Primary link circuit number (at SoftX3000 side)	16
5	Termination ID of primary link circuit number (at UMG8900 side)	16
6	Primary link logic C-channel ID	12345
7	Secondary link circuit number (at SoftX3000 side)	48
8	Termination ID of secondary link circuit number (at UMG8900 side)	48
9	Protection group type	Protection group 1
10	Start L3 address of subscriber port	0
11	Phone number of ESL subscriber A (whose L3 address is 0)	6540080
12	Phone number of ESL subscriber B (whose L3 address is 1)	6540081
13	Phone number of ISDN subscriber C (whose L3 address is 16)	6540082, 6540083
14	Phone number of ISDN subscriber D (whose L3 address is 17)	6540084, 6540085
15	Interface ID of BRA link of ISDN subscriber C	12345
16	Interface ID of BRA link of ISDN subscriber D	54321

1.9.2 Script

I. Configuring MG data

//Add a UMG8900 with equipment ID as "211.169.150.9:2944".

```
ADD MGW: EID="211.169.150.9:2944", GWTP=UMGW, MGWDESC="shenzhen-UMG8900-02",
MGCMODULENO=22,     LA="191.169.150.30",     RA1="211.169.150.9",     RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

 Note:

- For UMG8900, no matter whether it serves as AG or TG, the format of the parameter "equipment ID" in this command must be "IP address: Port number", and "Gateway Type" must be "UMGW".
- The parameter "Remote address1" in this command must be the IP address used for H.248 protocol in UMG8900. Here, it is 211.169.150.9.
- Because H.248 protocol of UMG8900 only supports binary mode, the parameter "code Type" in this command must be "ASN.1".
- Because UMG8900 supports hairpin connection function, the parameter "hair pin connection" in this command must be "Supported".
- Because UMG8900 supports EC, Fax and Modem functions, the default values are adopted for the options "EC", "No Fax" and "No Modem" in the parameters "EC" and "special attributes".

II. Configuring V5UA data

//Add an embedded SG (in UMG8900), with SG ID as 5.

```
ADD ESG: SGID=5, SGNAME="V5UA SG", EID="211.169.150.9:2944";
```

 Note:

Because the SG is embedded in UMG8900, the parameter "equipment ID" in the command must be the equipment ID of UMG8900. Here it is 211.169.150.9:2944.

//Add a V5UA link set with index as 0.

```
ADD V5UALKS: LSX=0, LSNAME="V5UA LinkSet", TM=LOADSHARE, SGID=5;
```

📖 **Note:**

- Unless otherwise noted, it is suggested to set the traffic mode of a linkset to "Load-share".
- The traffic mode of a linkset must be consistent with that of SG; otherwise, all V5UA links of this linkset cannot work normally.

//Add two V5UA links, with SoftX3000 as Client, local SCTP port number of link 0 of module 136 as 5675, local SCTP port number of link 0 of module 137 as 5676, and remote SCTP as default value 5675.

```
ADD V5UALNK: MN=136, LNKN=0, LSX=0, LOCPORT=5675, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.10";
ADD V5UALNK: MN=137, LNKN=0, LSX=0, LOCPORT=5676, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.10";
```

📖 **Note:**

- The "Remote address1" in this command must be the IP address used for SIGTRAN protocol in UMG8900. Here, it is 191.169.150.10.
- To ensure the reliability of the IUA links, allocate the two IUA links to different BSGIs (if the system is configured with two BSGIs). In this example, one link is configured to module 136, and the other to module 137.

III. Configuring V5 trunk data

//Add a V5 trunk group with group number as 5.

```
ADD V5TG: TGID=5, MGEID="211.169.150.9:2944", TGN="V5TG";
```

//Add V5 trunk circuit, with start E1 number as 0, end E1 number as 1, V5UA linkset number as 15, start termination ID as 0 and start MG E1 ID as 0.

```
ADD V5TKC: MN=22, SEN=0, EEN=1, TGID=5, SLNKID=15, LNKS=0, STID=0, SMGEID=0;
```

📖 **Note:**

- The parameters "Start E1 number" and "End E1 number" in the command are the universal logical numbers of E1 trunk circuits, such as No. 7, PRA, R2 and V5 in a FCCU/FCSU module. Their physical numbers at UMG8900 side are defined by the parameter "start MG E1 ID".
- The parameter "V5UA Linkset number" in the command is one of the parameters used for SoftX3000 interconnecting with V5 AN device.
- The absolute value of the difference between start circuit number (0) and start termination ID must be the integral times of 32, such as 0, 32, 64, and 96.

IV. Configuring V5 interface data

//Add a V5 interface, with interface ID as 5678, primary link circuit number as 16, secondary link circuit number as 48, primary link logic C-channel ID as 12345, protocol type as V5.2 and protect group type as protect group 1.

```
ADD V5I: IFID=5678, TGID=5, PNUM=16, MID=12345, IFTP=V52, BS=B1, SNUM=48;
```

V. Configuring subscriber data

//Add ISDN data, with ISDN index as 1 and Maximum B channel as 2.

```
ADD ISDNDAT: ISDNX=1, BCHN=2;
```

📖 **Note:**

For BRA subscribers, the parameter "maximum B channel" must be set to 2.

//Add two V5 ESL subscribers.

```
ADD VSBR: D=K'6540080, LP=0, DID=V5ST, IID=5678, L3ADDR=0, CODEC=PCMA, RCHS=65,
CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540081, LP=0, DID=V5ST, IID=5678, L3ADDR=1, CODEC=PCMA, RCHS=65,
CSC=0, NS=CLIP-1;
```

 Note:

- The L3 addresses of V5 subscriber ports are numbered from 0.
- If you want to enable the CID function for V5 subscribers, select "CLIP" in the parameter "console supplementary service" in this command.

//Add two V5 BRA subscribers (default subscribers).

```
ADD BRA: D=K'6540082, LP=0, DID=V5BRA, V5IID=5678, L3ADDR=16, CODEC=PCMA,
RCHS=65, CSC=0, AUT=NRM, NS=CLIP-1, ISDN=1, ISDNDS=12345, ISA=MSN-1;
ADD BRA: D=K'6540084, LP=0, DID=V5BRA, V5IID=5678, L3ADDR=17, CODEC=PCMA,
RCHS=65, CSC=0, AUT=NRM, NS=CLIP-1, ISDN=1, ISDNDS=54321, ISA=MSN-1;
```

 Note:

- Each V5 BRA subscriber has one L3 address. Each ESL BRA subscriber has two termination IDs.
- To enable the CID function for the BRA subscribers, set the parameter "supplementary service" in the command to "CLIP".
- To enable the Multiple Subscriber Number (MSN) function for BRA subscribers, set the parameter "ISDN features" in the command to "Multi-subscriber number".

//Add MSN for BRA subscribers.

```
ADD MSN: OD=K'6540082, ND=K'6540083, LP=0, CGF=NO;
ADD MSN: OD=K'6540084, ND=K'6540085, LP=0, CGF=NO;
```

VI. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

 Note:

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.9.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and UMG8900 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether UMG8900 has been registered normally

Execute the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether UMG8900 has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that UMG8900 has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that UMG8900 has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and UMG8900 has been modified.
- If "Fault" is displayed, it indicates the UMG8900 cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether V5UA link is normal

Execute the **DSP V5UALNK** command at U-SYS SoftX3000 Client to check whether the status of V5UA link is normal. If the status is abnormal, use the command **LST V5UALKS** to check whether the transmission mode of the linkset is configured correctly, and then use the **LST V5UA LNK** command to check whether the local port

number, local IP address, peer port number, peer IP address and working mode are configured correctly.

IV. Check whether V5 links work normally

Execute the **DSP V5LNK** command at U-SYS SoftX3000 Client to check whether all V5 links in the V5 interface are working normally. If they are abnormal, use the **LST V5TKC** command to check the E1 numbers, V5 link ID of start E1, start MG terminal ID and start MG E1 ID are configured normally.

V. Check whether V5 interface works normally

Execute the **DSP V5IFC** command at U-SYS SoftX3000 Client to check whether the status of the V5 interface is normal. If it is abnormal, use the **LST V5I** command to check the V5 interface ID, primary link circuit number, secondary link circuit number, and primary link logic C-channel ID are configured correctly.

VI. Testing service by making a call

If all the above items are normal, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

- Execute the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.
- Check whether the data configuration at UMG8900 side or V5 AN device is correct if the data at SoftX3000 side is configured correctly.

1.10 Configuring Data for Interconnecting with SIP Terminal

1.10.1 Introduction

I. Typical networking model

When a SIP terminal accesses SoftX3000 through IP MAN, it is applied to provide subscribers with multimedia services, including voice service, data service and video service. Figure 1-11 illustrates the typical networking model when a SIP terminal adopts Session Initiation Protocol (SIP) to access SoftX3000.
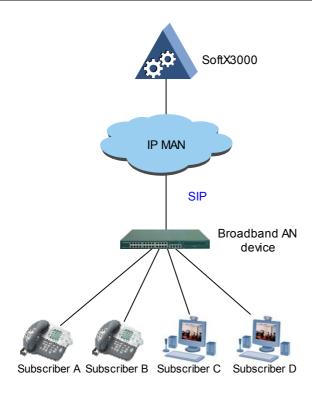
Figure 1-11 Typical networking model for SIP terminal accessing SoftX3000

As shown in Figure 1-11, subscriber A and subscriber B are SIP hard terminals, for example, SIP phones, and subscriber C and subscriber D are SIP soft terminals, for example, OpenEye of Huawei. No matter which type the SIP terminal belongs to, the data configuration processes at SoftX3000 side are the same.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- The subscribers all can register the CID function.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, you need to negotiate with the maintenance personnel at SIP terminal side about the following parameters as shown in Table 1-12.

Table 1-12 Parameters for SoftX3000 interconnecting with SIP terminal

Serial No.	Parameter	Value
1	Communication protocol adopted between SoftX3000 and SIP terminal	SIP
2	Well-known port number of SIP	5060

Serial No.	Parameter	Value
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	Registered user name (equipment ID) of subscriber A	8780001
5	Registered password of subscriber A	112233
6	Phone number of subscriber A	8780001
7	Registered user name (equipment ID) of subscriber B	8780002
8	Registered password of subscriber B	223344
9	Phone number of subscriber B	8780002
10	Registered user name (equipment ID) of subscriber C	8780003
11	Registered password of subscriber C	334455
12	Phone number of subscriber C	8780003
13	Registered user name (equipment ID) of subscriber D	8780004
14	Registered password of subscriber D	445566
15	Phone number of subscriber D	8780004

1.10.2 Script

Because SIP data is public data, it is unnecessary to configure it here if you have already configured it.

I. Configuring SIP data

//Set global configuration information of SIP.

```
SET SIPCFG:
```

//Set local port number for the MSGI board used to process SIP(the module number is 211)

```
SET SIPLP: MN=211, PORT=5061;
```

📖 **Note:**

The first SIP message sent from the SIP terminal to the SoftX3000 includes the SIP well-know port number 5060. After receiving the SIP message, the IFMI sends it in load sharing mode to the MSGI. Then the IFMI of the SoftX3000 sends the SIP message containing the local port number 5061 of the MSGI. The SIP terminal receives the returned SIP message and sends a subsequent one, which contains the local port number 5061 of the MSGI in the first SIP message. After receiving the packet, the IFMI of the SoftX3000 directly sends it to the MSGI whose local port number is 5061.

II. Configuring STUN data

//Add local port of STUN protocol (optional), with IFMI module number as 132.

```
ADD STUNDISP: FMN=132;
```

📖 **Note:**

- When a SIP terminal is OpenEye manufactured by Huawei and the IP address of the SIP terminal is in private network, the local port of STUN protocol must be added at SoftX3000 side to make SoftX3000 and SIP terminal interconnected correctly.
- By default, all MSGI modules can distribute STUN protocol. If you have modified this capability, use the **SET DPA** command to reset it.

//Set dispatch ability to enable the IFMI module to dispatch STUN protocol.

```
SET DPA: MN=132, DA=STUN-1;
```

III. Configuring MG data

//Add four multimedia devices adopting SIP.

```
ADD MMTE: EID="8780001", MN=22, PT=SIP, IFMMN=132, PASS="112233", AT=ABE;
ADD MMTE: EID="8780002", MN=22, PT=SIP, IFMMN=132, PASS="223344", AT=ABE;
ADD MMTE: EID="8780003", MN=22, PT=SIP, IFMMN=132, PASS="334455", AT=ABE;
ADD MMTE: EID="8780004", MN=22, PT=SIP, IFMMN=132, PASS="556677", AT=ABE;
```

📖 **Note:**

The parameter "Equipment ID" in this command is equivalent to the registered user name of SIP, and the parameter "authentication password" is equivalent to the registered password of SIP.

IV. Configuring subscriber data

//Add four SIP subscribers.

```
ADD MSBR: D=K'8780001, LP=0, EID="8780001", RCHS=87, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780002, LP=0, EID="8780002", RCHS=87, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780003, LP=0, EID="8780003", RCHS=87, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780004, LP=0, EID="8780004", RCHS=87, CSC=0, NS=CLIP-1;
```

V. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'878, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_878";
```

📖 **Note:**

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 878 in the above example.

1.10.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and SIP terminal is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the SIP terminal has been registered normally

Execute the **DSP EPST** command on the U-SYS SoftX3000 Client to see whether the SIP terminal has been registered normally, and then decide the next steps according to the returned result.

- If "Register" is returned, it indicates that the SIP terminal has been registered and its data configuration is correct.
- If "UnRegister" is displayed, it indicates the SIP terminal cannot be registered. In this case, use the **LST MMTE** command to check whether the parameters, such as equipment ID, registration/authentication type and registration/authentication password, are correctly configured.

III. Testing service by making a call

If the SIP terminal is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise, check whether the parameters at SIP side are configured correctly.

1.11 Configuring Data for Interconnecting with H.323 Terminal

1.11.1 Introduction

I. Typical networking model

When an H.323 terminal accesses SoftX3000 through IP MAN, it is applied to provide subscribers with multimedia services, including voice service, data service and video service. Figure 1-12 illustrates the typical networking model when an H.323 terminal adopts H.323 protocol to access SoftX3000.
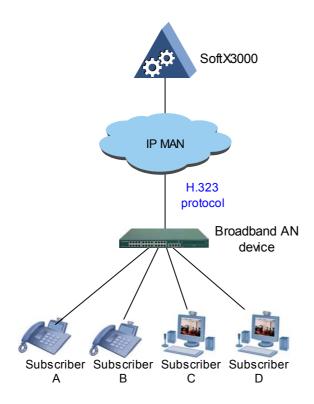
Figure 1-12 Typical networking model for H.323 terminal accessing SoftX3000

As shown in Figure 1-12, subscriber A and subscriber B are H.323 hard terminals, for example, H.323 phones, and subscriber C and subscriber D are H.323 soft terminals, for example, OpenEye of Huawei. No matter which type the SIP terminal belongs to, the data configuration processes at SoftX3000 side are the same.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- The subscribers can call each other.
- The subscribers all can register the CID function.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, you need to negotiate with the maintenance personnel at H.323 terminal side about the following parameters as shown in Table 1-13.

Table 1-13 Parameters for SoftX3000 interconnecting with H.323 terminal

Serial No.	Parameter	Value
1	Communication protocol adopted between SoftX3000 and H.323 terminal	H.323 protocol

Serial No.	Parameter	Value
2	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
3	Equipment ID of subscriber A (the same with phone number)	8780011
4	Registration password of subscriber A	556677
5	Phone number of subscriber A	8780011
6	Equipment ID of subscriber B (the same with phone number)	8780012
7	Registration password of subscriber B	667788
8	Phone number of subscriber B	8780012
9	Equipment ID of subscriber C (the same with phone number)	8780013
10	Registration password of subscriber C	778899
11	Phone number of subscriber C	8780013
12	Equipment ID of subscriber D (the same with phone number)	8780014
13	Registration password of subscriber D	990011
14	Phone number of subscriber D	8780014

1.11.2 Script

Because H.323 protocol data is public data, it is unnecessary to configure it here if you have already configured it.

I. Configuring H.323 protocol data

//Add system configuration of H.323 protocol, with system name as SoftX3000.

```
ADD H323SYS: SYSNM="SoftX3000";
```

 Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GK, GW or MCU in the H.323 network.

//Add application layer configuration of H.323. The number of TCP port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

 Note:

- Because the system is configured with one MSGI, the parameter "MSG Module type" in the command must be set to "RAS & CALL application".
- For detailed information about the port number configuration principle, see related contents in Chapter 7, "Configuring Protocol Data", in *U-SYS SoftX3000 SoftSwitch System Operation Manual Configuration Guide.*
- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Modifying public parameters

//Modify public parameters (only when SoftX3000 is interconnected with OpenEye adopting H.323 protocol).

```
MOD PUBPRM: ID=P45, VAL=1;
```

III. Configuring STUN data

//Add local port of STUN protocol (optional), with IFMI module number as 132.

```
ADD STUNDISP: FMN=132;
```

 Note:

- When a H.323 terminal is OpenEye manufactured by Huawei and the IP address of the H.323 terminal is in private network, the local port of STUN protocol must be added at SoftX3000 side to make SoftX3000 and H.323 terminal interconnected correctly.
- By default, all MSGI modules can distribute STUN protocol. If you have modified this capability, use the **SET DPA** command to reset it.

//Set dispatch ability to enable the IFMI module to dispatch STUN protocol.

```
SET DPA: MN=132, DA=STUN-1;
```

IV. Configuring MG data

//Add four multimedia devices adopting H.323 protocol.

```
ADD MMTE: EID="8780011", MN=22, PT=H323, DT=TERMINAL, PASS="556677", AT=ABE;
ADD MMTE: EID="8780012", MN=22, PT=H323, DT=TERMINAL, PASS="667788", AT=ABE;
ADD MMTE: EID="8780013", MN=22, PT=H323, DT=TERMINAL, PASS="778899", AT=ABE;
ADD MMTE: EID="8780014", MN=22, PT=H323, DT=TERMINAL, PASS="990011", AT=ABE;
```

 Note:

- When the multimedia terminal adopts H.323 protocol, the parameter "equipment ID" in this command must be consistent with the equipment ID (such as phone number) of the H.323 terminal.
- The "Device type" in the command must be set to "Terminal", which is different from that set for H.323 IAD.

V. Configuring subscriber data

//Add four H.323 subscribers.

```
ADD MSBR: D=K'8780011, LP=0, EID="8780011", RCHS=87, CSC=0, NS=CLIP-1;

ADD MSBR: D=K'8780012, LP=0, EID="8780012", RCHS=87, CSC=0, NS=CLIP-1;

ADD MSBR: D=K'8780013, LP=0, EID="8780013", RCHS=87, CSC=0, NS=CLIP-1;

ADD MSBR: D=K'8780014, LP=0, EID="8780014", RCHS=87, CSC=0, NS=CLIP-1;
```

VI. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'878, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_878";
```

 Note:

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 878 in the above example.

1.11.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and H.323 terminal is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check

whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the H.323 terminal has been registered normally

Execute the **DSP EPST** command on the U-SYS SoftX3000 Client to see whether the H.323 terminal has been registered normally, and then decide the next steps according to the returned result.

- If "Register" is returned, it indicates that the H.323 terminal has been registered and its data configuration is correct.
- If "UnRegister" is displayed, it indicates the H.323 terminal cannot be registered. In this case, use the **LST MMTE** command to check whether the parameters, such as equipment ID and registration/authentication type, are correctly configured.

III. Testing service by making a call

If the H.323 terminal is registered successfully, make a call to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise, check whether the parameters at H.323 side are configured correctly.

1.12 Configuring Data for Interconnecting with U-Path

1.12.1 Introduction

I. Typical networking model

U-Path is an IP console product of Huawei Technologies. It can directly access SoftX3000 through IP MAN and provide enterprise subscribers (that is, Centrex subscribers) with operator operation functions, such as call transfer, extension authority management, extension charging management and voice mailbox management. Figure 1-13 illustrates the typical networking model when U-Path accesses SoftX3000.
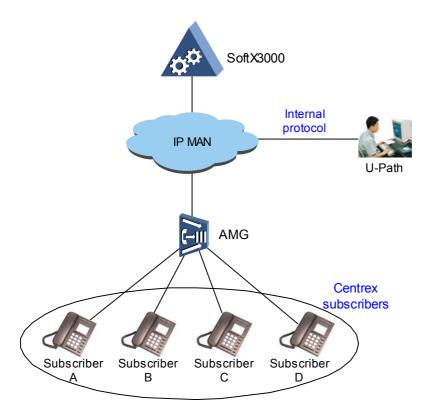
Figure 1-13 Typical networking model for U-Path accessing SoftX3000

In the networking model in Figure 1-13, Centrex subscribers can be of any type, including ESL subscribers, V5 subscribers and H.323 subscribers. For description purpose, we assume the Centrex subscribers here are all ESL subscribers.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- Subscribers A, B, C and D are Centrex subscribers, and all of them can dial one another by short numbers.
- U-Path can transfer all incoming calls, such as call from external subscriber to intra-group subscriber, and call from intra-group subscriber to toll exchange.
- The operator can manage the call-in authorities, call-out authorities and supplementary service authorities of Centrex intra-group subscribers on U-Path.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, you need to negotiate with the maintenance personnel at U-Path side and AMG side about the following parameters as shown in Table 1-14 and Table 1-15.

Table 1-14 Parameters for SoftX3000 interconnecting with U-Path

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of U-Path	211.169.150.11/255.255.0.0
3	U-Path number	1
4	Registered user name of U-Path	upath
5	Registered password of U-Path	ngnsx
6	Phone number of U-Path	6540099 (short number: 2099)

Table 1-15 Parameters for SoftX3000 interconnecting with AMG

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and AMG	MGCP
2	MGCP code type	ABNF
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of AMG	211.169.150.12/255.255.0.0
5	Domain name of AMG	Shenzhen-amg5000-02.com
6	Local UDP port number of MGCP at SoftX3000 side	2727
7	Local UDP port number of MGCP at AMG side	2427
8	Interface name of AMG	aaln
9	Numbering plan of termination ID (subscriber port) of AMG	Starting from 0
10	Speech codecs supported by AMG	G.711A, G.711μ, G.723.1, G.729A
11	Whether AMG supports hairpin connection	No
12	Whether AMG supports EC function	Yes
13	Phone number of subscriber A (whose termination ID is 0)	6540090 (short number: 2090)
14	Phone number of subscriber B (whose termination ID is 1)	6540091 (short number: 2091)
15	Phone number of subscriber C (whose termination ID is 2)	6540092 (short number: 2092)
16	Phone number of subscriber D (whose termination ID is 3)	6540093 (short number: 2093)

1.12.2 Script

I. Configuring Centrex data (including U-Path data)

//Add a Centrex group, with group number as 1 and out-group prefix as 9.

```
ADD CXGRP: CGN="Huawei", CXG=1, OGP=K'9, DOD2=YES, UCPC=100;
```

//Add Centrex intra-group prefix (short number) 2, with maximum number length and minimum number length both as 4.

```
ADD ICXPFX: CXG=1, PFX=K'2, CSA=CIG, MINL=4, MAXL=4;
```

📖 **Note:**

Because prefix 2 is used for the calls between intra-group subscribers, the parameter "service attribute" must be set to "Intra-Centrex".

//Set local address controlling IP console (the IP address is of the FE port of the IFMI board).

```
SET CONADDR: CONLAIP="191.169.150.30";
```

//Add local port of STUN protocol (optional), with IFMI module number as 132.

```
ADD STUNDISP: FMN=132;
```

📖 **Note:**

- When the IP address of the U-Path is in private network, the local port of STUN protocol must be added at SoftX3000 side to make SoftX3000 and U-Path interconnected correctly.
- By default, all MSGI modules can distribute STUN protocol. If this capability is modified, use the SET DPA command to reset it.

//Set dispatch ability to enable the IFMI module to dispatch STUN protocol.

```
SET DPA: MN=132, DA=STUN-1;
```

//Add an IP console (U-Path) with console number as 1, account name as upath, password as ngnsx, Centrex short number as 2099 and call source code as 1.

```
ADD    CXCON:    D=K'6540099,    MN=22,    CONNO=1,    IP="211.169.150.11",
CODEC=G711_A-1&G711_U-1&G723_1-1&G729A-1, ACNT="upath", PWD="ngnsx", CXG=1,
CXD=K'2099,   RCHS=65,   CSC=1,   AUT=NRM,   OCR=NTT-1&ITT-1&INTT-1&IITT-1,
COR=NTT-1&ITT-1&INTT-1&IITT-1;
```

📖 **Note:**

- To use a public dynamically-obtained IP address for the U-Path, enter **255.255.255.255**. SoftX3000 will not authenticate the IP address..
- To use a public static IP address for the U-Path, enter a valid IP address (such as 191.169.150.99), or 255.255.255.255. SoftX3000 will authenticate the IP address in the former case.
- To use a private IP address for the U-Path, you must enter **255.255.255.255.** Using another private IP addresses, the U-Path cannot be registered successfully, and the SoftX3000 will not authenticate the IP address.

II. Configuring MG data

//Add an AMG adopting MGCP with equipment ID as "shenzhen-amg5000-02.com".

```
ADD          MGW:          EID="shenzhen-amg5000-02.com",          GWTP=AG,
MGWDESC="shenzhen-amg5000-02",          MGCMODULENO=22,          PTYPE=MGCP,
LA="191.169.150.30",          RA1="211.169.150.12",          RP=2427,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,          HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1;
```

III. Configuring subscriber data

//Add four ESL subscribers.

```
ADB   VSBR:   SD=K'6540090,   ED=K'6540093,   LP=0,   MN=22,   DID=ESL,
EID="shenzhen-amg5000-02.com", STID=0, CODEC=PCMA, RCHS=65, CSC=1, NS=CLIP-1,
CGF=YES, CXG=1, SCXD=K'2090, COR=ITT-1&IITT-1;
```

 Note:

- Because the Centrex subscribers have to listen to second-stage dial tone after dialing out-group prefix, the parameter "call source code" in this command is set to "1", that is, the number of pre-received digits is 1.
- If you want to enable the CID function for ESL subscribers, select "CLIP" in the parameter "console supplementary service" in this command.
- To manage all call-in rights, call-out rights and supplementary service rights of Centrex intra-group subscribers, it is required to tick "Select All" of the parameters "call in right", "call out right" and "supplementary service".

IV. Configuring number analysis data

//Add call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

 Note:

- You must configure a valid "charging selection code" (it is 0 in the above example) for each call prefix to ensure the charging reliability.
- The priority level of the intra-office group charging mode is higher than that of the destination code charging mode. Therefore, the SoftX3000 prefers the intra-office group charging mode when an intra-office subscriber dials the prefix 654 in the above example.

1.12.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the ESL subscribers connected to the AMG are normal

See commissioning guideline in Section 1.6 Configuring Data for Interconnecting with AMG (through MGCP).

II. Checking whether U-Path can be registered successfully

After configuring the related parameters on the U-Path, start U-Path client. If the U-Path is registered normally in SoftX3000, access the console GUI. If it is not registered normally, the access will be denied. In this case, perform the following operations:

- Use the **LST CXCON** command to check whether the console number, IP address, registered name, and password are correct.
- Check whether the data configuration at U-Path side is correct if the data at SoftX3000 side is configured correctly.

Chapter 2 Trunk Signaling Networking

2.1 Configuring Basic Data

2.1.1 Data Planning

To configure trunk interworking data, make sure that necessary basic data including equipment data, local office data, and charging data must have been configured. For the convenience of description, all configuration examples mentioned in this chapter are based on the same basic data.

I. Equipment data

1) Equipment configuration

In this example, SoftX3000 is only configured with one basic frame located at frame position 2 in the integrated configuration cabinet. Figure 2-1 shows its configuration.

Back boards	BFII	BFII			EPII	EPII	SIUI	HSCI	SIUI	HSCI				CKII	CKII			UPWR		UPWR	UPWR
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Front boards	IFMI	IFMI	FCCU	FCCU	FCSU	FCSU	SMUI		SMUI		BSGI	BSGI	MSGI	MSGI	CDBI	CDBI	ALUI	UPWR		UPWR	UPWR

Figure 2-1 Equipment configuration

2) Basic board information

Table 2-1 Basic board information

Frame No. / Slot No.	Position	Type	Active/standby	Module No.
0 / 0	Front	IFMI	Active	132
0 / 1	Front	IFMI	Standby	132
0 / 2	Front	FCCU	Active	22

Frame No. / Slot No.	Position	Type	Active/standby	Module No.
0 / 3	Front	FCCU	Standby	22
0 / 4	Front	FCSU	Active	23
0 / 5	Front	FCSU	Standby	23
0 / 10	Front	BSGI	independently	136
0 / 11	Front	BSGI	Work independently	137
0 / 12	Front	MSGI	Active	211
0 / 13	Front	MSGI	Standby	211
0 / 14	Front	CDBI	Active	102
0 / 15	Front	CDBI	Standby	102
0 / 4	Back	EPII	Active	–
0 / 5	Back	EPII	Standby	–
0 / 13	Back	CKII	Active	–
0 / 15	Back	CKII	Standby	–

 Note:

- The CKII can only be configured in slots 13 and 15 in the back half of the basic frame (frame 0).
- The slot number of the EPII must correspond to that of the FCSU.

3)   IP address of the serving FE port: 191.169.150.30/255.255.0.0

II. Local office data

1)   Signaling point code (SPC) of the local office: 001122, significant in the national network
2)   Information related to the local DN set 0: Country code 86 and national toll area code 755
3)   Number segment 1: 2225000 through 2225999
4)   Number segment 2: 3331000 through 3331999
5)   Number segment 3: 6540000 through 6540999
6)   Number segment 4: 8780000 through 8780999

III. Charging data

1)   Charging case 0: SoftX3000 provides detailed tickets for charge of calls. Calls made on Saturdays and Sundays are charged 40% off. Calls made during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays are charged 40% off, too.

2) Charging case 10: SoftX3000 provides charging meters for charge of calls. The charging meter 1 counts twice for the first 180 seconds and then counts once every 60 seconds. No discount is provided during different time segments in each day.

3) Charging case 20: SoftX3000 provides charging meters for charge of calls. The charging meter 2 counts once for the first 60 seconds and then counts once every 60 seconds. No discount is provided during different time segments in each day.

4) SoftX3000 uses the intra-office group charging mode for intra-office calls in this example, as shown in Table 2-2.

Table 2-2 Intra-office group charging mode

Calling relationship	Caller charging source code	Callee charging source code	Changing case
Subscribers in number segment 1 call each other.	22	22	10
Subscribers in number segment 2 call each other.	33	33	10
Subscribers in number segment 3 call each other.	65	65	10
Subscribers in number segment 4 call each other.	87	87	10
Subscriber in number segment 1 calls subscriber in a different number segment.	22	254	20
Subscriber in number segment 2 calls subscriber in a different number segment.	33	254	20
Subscriber in number segment 3 calls subscriber in a different number segment.	65	254	20
Subscriber in number segment 4 calls subscriber in a different number segment.	87	254	20

 Note:

As shown in Table 2-2, the former four charging modes are used in an individual business coverage and the latter four between business coverages.

5) SoftX3000 uses the destination code charging mode for outgoing trunks in this example, as shown in Table 2-3.

Table 2-3 Destination code charging mode

Call destination	Caller charging source code	Charging selection code	Changing case
Outgoing calls made by local subscriber number started with 222.	22	0	0
Outgoing calls made by local subscriber number started with 333.	33	0	0
Outgoing calls made by local subscriber number started with 654.	65	0	0
Outgoing calls made by local subscriber number started with 878.	87	0	0
All calls on incoming trunk groups	88	0	0
All calls on outgoing trunk groups	99	0	0

2.1.2 Script

I. Getting offline

//Set offline.

```
LOF:;
```

//Set alarm switch to "Off".

```
SET CWSON: SWT=OFF;
```

//Set format conversion switch to "OFF".

```
SET FMT: STS=OFF;
```

II. Configuring equipment data

//Add a rack numbered 0.

```
ADD SHF: SN=0, LT="shenzhen-SoftX3000", PN=0, RN=0, CN=0, PL=2;
```

 Note:

Because the integrated cabinet is configured with only one basic frame in this example and the position number of the basic frame is 2 invariably, the "PDB location" in the command can only be set to 2, that is, the basic frame controls the Power Distribution Box (PDB).

//Add a frame numbered 0 in the position 2.

```
ADD FRM: FN=0, SN=0, PN=2;
```

 Note:

For the basic frame in the integrated configuration cabinet, it is fixed that its frame number is 0 and position number in the rack is 2.

//Add boards. (Assisting boards are inserted in adjacent slots.)

```
ADD BRD: FN=0, SN=0, LOC=FRONT, BT=IFMI, MN=132, ASS=1;
ADD BRD: FN=0, SN=2, LOC=FRONT, BT=FCCU, MN=22, ASS=3;
ADD BRD: FN=0, SN=4, LOC=FRONT, BT=FCSU, MN=23, ASS=5, LNKT=LINK_64K;
ADD BRD: FN=0, SN=10, LOC=FRONT, BT=BSGI, MN=136, ASS=255;
ADD BRD: FN=0, SN=11, LOC=FRONT, BT=BSGI, MN=137, ASS=255;
ADD BRD: FN=0, SN=12, LOC=FRONT, BT=MSGI, MN=211, ASS=13;
ADD BRD: FN=0, SN=14, LOC=FRONT, BT=CDBI, MN=102, ASS=15;
ADD BRD: FN=0, SN=4, LOC=BACK, BT=EPII;
ADD BRD: FN=0, SN=5, LOC=BACK, BT=EPII;
ADD BRD: FN=0, SN=13, LOC=BACK, BT=CKII;
ADD BRD: FN=0, SN=15, LOC=BACK, BT=CKII;
```

📖 **Note:**

1) The BSGIs are configured to work in load sharing mode generally, that is, one module number is configured for one board, so the parameter "assist slot number" in the command must be set to 255.

2) SoftX3000 also supports that the BSGIs work in active & standby mode. However, the BSGIs do not support Q.931 protocol (call processing adaptation module) and they need not save the information of the established calls, so it is unnecessary to configure them to work in active & standby mode. To enhance the resource utilization rate of the equipment, it is recommended to set the BSGIs to work in load sharing mode.

3) The module number configuration of each board is suggested as follows:

- The module number of the SMUI: from 2 to 21 in ascending order.
- The module number of the FCCU: from 22 to 101 in ascending order.
- The module number of the UCSI: from 101 to 22 in descending order.
- The module number of the CDBI: from 102 to 131 in ascending order.
- The module number of the IFMI: from 132 to 135 in ascending order.
- The module number of the BSGI: from 136 to 211 in ascending order.
- The module number of the MSGI: from 211 to 136 in descending order.
- The module Number of the MRCA: from 212 to 247 in ascending order.

//Add an FE port configuration. (The default gateway address is the IP address of the associated router.)

```
ADD FECFG: MN=132,IP="191.169.150.30", MSK="255.255.0.0",
DGW="191.169.150.60", EA=AUTO;
```

📖 **Note:**

Make sure that the IP address of the default router (gateway) for the FE port is set correctly; otherwise, SoftX3000 cannot communicate with IP devices.

//Add all central database functions.

```
ADD CDBFUNC: CDPM=102,
FCF=LOC-1&TK-1&MGWR-1&BWLIST-1&IPN-1&DISP-1&SPDNC-1&RACF-1&PRESEL-1&UC-1&K
S-1;
```

📖 **Note:**

If the system is configured two pairs of CDBI boards, allocate database functions between the two groups of CDBI boards according to load sharing principle. If there is only one pair of CDBI boards, allocate all database functions for them.

//Add an E1 port configuration.

```
ADD EPICFG: FN=0, SN=4, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF, E7=DF;
```

📖 **Note:**

- When an E1 port on the EPII in the slot 4 is added, the system automatically adds an E1 port on the EPII in the slot 5. That is, the system considers the EPII in the slot 5 the standby board of the EPII in the slot 4 by default.
- The E1 port configuration must keep consistent with the opposite device. In this example, double-frame format and non-balance mode (connected to 75-ohm coaxial cable) are used for E1 port.

//Set CKII clock. The stratum-2 clock works in an automatic mode. Clock signals through the BITS1 interface on the CKII are of 2 MHz type and clock signals through the BITS2 interface are of 2 Mbit/s type.

```
SET CKICFG: CL=LEVEL2, WM=AUTO, B1CST=CLK_2M, B2CST=CLK_E1;
```

📖 **Note:**

- When SoftX3000 provides message transfer part (MTP) links by itself, clock related data must be configured. Otherwise, MTP links cannot work normally.
- Clock data varies with synchronization networking conditions. For details, refer to Chapter 5, "Specialized Configurations", in this manual. Here it is assumed that SoftX3000 locks BITS clock.

III. Configuring local office data

//Set local office information. The signaling point code of the local office is 001122 (national network).

```
SET OFI: OFN="SZSX", LOT=CMPX, NN=YES, SN1=NAT, SN2=NAT, SN3=NAT, SN4=NAT,
NPC="001122", NNS=SP24, SPF=YES;
```

//Add a local DN set. The local DN set is 0. The country code is 86. The national toll area code is 755.

```
ADD LDNSET: LP=0, NC=K'86, AC=K'755, LDN="ShenZhen";
```

//Add call sources.

```
ADD CALLSRC: CSC=0, CSCNAME="Normal", PRDN=3;
ADD CALLSRC: CSC=1, CSCNAME="Centrex", PRDN=1;
```

 Note:

- For common subscribers, the number of pre-received digits is set to 3 generally. For Centrex subscribers, the number of pre-received digits is set to 1 usually. A Centrex subscriber (ESL subscriber or V5 subscriber) can hear the secondary dial tone after dialing the outgoing prefix.
- Set the subscriber call source code as 0–49, and the trunk call source code as 50–99 to separate the subscriber call source code from the trunk call source code. For pure tandem exchange, the call source code can start from 0.

//Add number segments.

```
ADD DNSEG: LP=0, SDN=K'2225000, EDN=K'2225999;
ADD DNSEG: LP=0, SDN=K'3331000, EDN=K'3331999;
ADD DNSEG: LP=0, SDN=K'6540000, EDN=K'6540999;
ADD DNSEG: LP=0, SDN=K'8780000, EDN=K'8780999;
```

IV. Configuring charging data

//Add charging cases. In the charging case 0, SoftX3000 provides detailed tickets for destination code charging. In the charging cases 10 and 20, SoftX3000 provides charging meters for intra-office group charging.

```
ADD CHGANA: CHA=0, CHGT=DETAIL;
ADD CHGANA: CHA=10, CHGT=PLSACC, MID=METER1;
ADD CHGANA: CHA=20, CHGT=PLSACC, MID=METER2;
```

//Modify charging modes.

```
MOD CHGMODE: CHA=0, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=0, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
```

```
MOD CHGMODE: CHA=0, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";

MOD CHGMODE: CHA=10, DAT=NORMAL, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=10, DAT=DTYPE1, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=10, DAT=DTYPE2, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=20, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=20, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=20, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

📖 **Note:**

- By default, Monday to Thursday are recognized as normal workdays, Friday recognized as Category 1, and Saturday and Sunday as Category 2.
- If only one time zone is to be defined, set the time zone 1 switch point and time zone 2 switch point to "00:00", and adopt the metering mode and discount of time zone 1.
- If three time zones are to be defined, the switch points are required to be set for them. The time segment after the time zone 3 switch point and before the time zone 1 switch point is the time zone 1, adopting the metering mode and discount of time zone 1. The time segment after the time zone 1 switch point and before the time zone 2 switch point is the time zone 2, adopting the metering mode and discount of time zone 2. The time segment after the time zone 2 switch point and before the time zone 3 switch point is the time zone 3, adopting the metering mode and discount of time zone 3.

//Add intra-office group charging.

```
ADD CHGGRP: RCHS=22, DCHS=22, LOAD=ALL, CODEC=ALL, CHA=10;
ADD CHGGRP: RCHS=33, DCHS=33, LOAD=ALL, CODEC=ALL, CHA=10;
ADD CHGGRP: RCHS=65, DCHS=65, LOAD=ALL, CODEC=ALL, CHA=10;
ADD CHGGRP: RCHS=87, DCHS=87, LOAD=ALL, CODEC=ALL, CHA=10;
ADD CHGGRP: RCHS=22, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=20;
ADD CHGGRP: RCHS=33, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=20;
ADD CHGGRP: RCHS=65, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=20;
ADD CHGGRP: RCHS=87, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=20;
```

📖 **Note:**

A wildcard 254 is used for "callee charging source code" in the last four commands for the purpose of simplifying data configuration.

//Add destination code charging. The caller charging source codes (22, 33, 65 and 87) are all used for destination code charging for intra-office subscribers.

```
ADD CHGIDX: CHSC=0, RCHS=22, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
ADD CHGIDX: CHSC=0, RCHS=33, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
ADD CHGIDX: CHSC=0, RCHS=65, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
ADD CHGIDX: CHSC=0, RCHS=87, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
```

//Add destination code charging. The caller charging source code 88 is used for destination code charging for incoming trunk groups and 99 for destination code charging for outgoing trunk groups.

```
ADD CHGIDX: CHSC=0, RCHS=88, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
ADD CHGIDX: CHSC=0, RCHS=99, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=0;
```

V. Formatting data and getting online

//Set format conversion switch to "ON".

```
SET FMT: STS=ON;
```

//Format data.

```
FMT:;
```

//Set alarm switch to "ON".

```
SET CWSON: SWT=ON;
```

//Set online.

```
LON:;
```

2.1.3 Commissioning Guideline

I. Restarting frame

Each frame is controlled by two power switches. To avoid misoperations (for example, BAM or iGWB is powered off unexpectedly), pull out the two SMUI boards after the frame is powered on and reinsert them to restart the frame.

II. Check whether loading is successful

1) Board running state

Start the client program "U-SYS SoftX3000 Client", and expand [System Navigator/Device Management/Device Management] on the [Management] tab to check the running states of the boards in the frame, as shown in Figure 2-2.
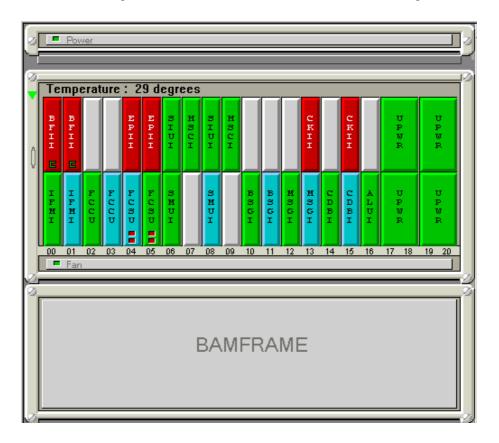
Figure 2-2 Board running states

As shown in Figure 2-2, the upper part shows the running states of the back boards, and the lower part displays the running states of the front boards. In SoftX3000, different colors stand for different running states, described as follows.

- Green: The board is running normally, and it is the active one.
- Blue: The board is running normally, and it is the standby one.
- Red: The board is faulty.
- Grey: The slot is not configured with any board.

In addition, there are two small rectangles on the FCSU. They represent the running states of the upper and lower CPCs on the FCSU.

2) Version information

If all boards run normally, the following check is to see whether the software versions of the boards are consistent with those described in the version configuration table. Carry

out the **DSP BVER** command on the U-SYS SoftX3000 Client to list the software versions of the boards.

If the software version of a board is not correct, use the **LST LSS** command to check whether the loading switch of the board is correct, that is, whether the status is "Program unavailable, data unavailable". If not, use **MOD LSS** to modify the software switch to this status, and reset the board to make it reloaded.

3)   Board data CRC
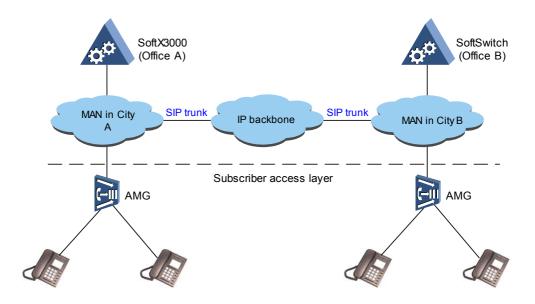
Run the **STR CRC** command on the U-SYS SoftX3000 Client to perform CRC to the data of a board. If CRC fails, reset the board to make it reloaded.

2.2 Configuring Data for Interconnecting with SoftSwitch (through SIP Trunk)

2.2.1 Introduction

I. Typical networking model

When SoftX3000 is networked for interworking with other SoftSwitch, IP-based inter-office signaling is used, such as Session Initiation Protocol (SIP) and H.323. In the case of SIP, a typical networking model is illustrated in Figure 2-3.

Figure 2-3 Typical networking model for SoftX3000 interworking with other SoftSwitch (through SIP trunk)

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Subscribers in the office A and subscribers in the office B can call each other.
2) Destination code charging is used for calls made from the office A to the office B.
3) Destination code charging is used for incoming trunks and outgoing trunks from the office A to the office B, for inter-office settlement.

III. Interconnection parameters

To configure data at SoftX3000 side, first negotiate the following interconnection parameters with the opposite office, as shown in Table 2-4.

Table 2-4 Interconnection parameters between SoftX3000 and other SoftSwitch

Serial No.	Parameter	Value
1	Type of signaling used between the offices	SIP
2	National toll area code of office B	0810
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of the opposite SoftSwitch	211.169.150.33/255.255.0.0
5	SIP well-known port number at SoftX3000 side	5060
6	SIP well-known port number at the opposite SoftSwitch side	5060
7	Whether SIP for Telephones (SIP-T) is supported	Supported

2.2.2 Script

SIP data is not specific to this configuration. If SIP data has been configured, it can be used here.

I. Configuring SIP data

//Set the global configuration information of SIP.

```
SET SIPCFG:
```

//Set the local port number of SIP.

```
SET SIPLP: MN=211, PORT=5061;
```

📖 **Note:**

The opposite softswitch sends the first SIP message containing the well-known port number 5050 to the local SoftX3000. After receiving the SIP message, the IFMI sends it in load sharing mode to the MSGI. Then the IFMI of the SoftX3000 sends the SIP message containing the local port number 5061 of the MGSI. The opposite softswitch receives the returned SIP message and sends a subsequent one, which contains the local port number 5061 of the MSGI in the first SIP message. After receiving the packet, the IFMI of the SoftX3000 directly sends it to the MSGI whose local port number is 5061.

II. Configuring routing data

//Add an office direction numbered 10 to the office B.

```
ADD OFC: O=10, ON="B_office", DOT=NATT, DOL=HIGH, METHOD=NOCONV;
```

📖 **Note:**

- Supposing the local office is a transit office and the opposite office is a toll office, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be higher than the local office.
- Because this office direction does not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.
- Office name must be specified depending on operators' requirements. Do not use the default name given by the system.

//Add a sub-route numbered 10.

```
ADD SRT: SRC=10, O=10, SRN="To B_office", TSM=CYC;
```

//Add a route numbered 10.

```
ADD RT: R=10, RN="To B_office", SR1=10;
```

//Add route analysis data to the office B. The route selection code is 81.

```
ADD RTANA: RSC=81, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=10,
ISUP=SIP_M;
```

📖 **Note:**

- Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".
- Because the signaling interconnection between the local office and the opposite office uses the SIP protocol, it is necessary to set the "signaling as prior" parameter in the command to "SIP select must".

III. Configuring SIP trunk data

//Add an SIP trunk group numbered 10, which does not send heartbeat signal.

```
ADD SIPTG: TG=10, SRT=10, TGN="To B_office", RCHS=88, OTCS=99 , IMN=132,
OSU="211.169.150.33:5060", UHB=NO, VEDIOS=SUPPORT;
```

📖 **Note:**

- Because destination code charging is used for both incoming and outgoing trunk groups, the parameters "charging source code" and "outgoing trunk charging source" in the command are set to 88 and 99 respectively, not 255.
- The "Remote URI" parameter in the command is set in the format of "*Opposite IP address*:*SIP port number*". Here it is set to "211.169.150.33:5060".
- The parameter "use heart beat" should be set correctly. If the peer equipment cannot identify heartbeat signals, this parameter must be set to "No"; otherwise, the SIP trunk will be faulty all the time.

IV. Configuring number analysis data

//Add a call prefix 0810.

```
ADD CNACLD: PFX=K'0810, CSA=NTT, RSC=81, MINL=4, MAXL=24, CHSC=0;
```

📖 **Note:**

- Because 0810 is an outgoing call prefix, the "route selection code" parameter in the command is set to 81, not 65535. The parameter has been defined in the command **ADD RTANA**
- Because destination code charging is used for the prefix 0810, the "charging selection code" parameter in the command is set to 0, not 65535.

2.2.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the SoftSwitch office B is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Testing service by making a call

If the network connection is normal, originate a call from the office A to the office B. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:

1)   Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and **LST SIPTG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.

2)   Use **LST SIPTG** to check whether the "Remote URI" parameter is configured correctly.

3)   Check whether data is configured correctly at the opposite side if no data configuration errors are found at SoftX3000 side.

2.3 Configuring Data for Interconnecting with SoftSwitch (through H.323 Trunk)

2.3.1 Introduction

I. Typical networking model

When SoftX3000 is networked for interworking with other SoftSwitch, IP-based inter-office signaling is used, such as SIP and H.323. In the case of H.323, a typical networking model is illustrated in Figure 2-4.

Figure 2-4 Typical networking model for SoftX3000 interworking with other SoftSwitch (through H.323 trunk)

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1)   Subscribers in the office A and subscribers in the office C can call each other.
2)   Destination code charging is used for calls made from the office A to the office C.
3)   Destination code charging is used for both incoming and outgoing trunks from the office A to the office C, for inter-office settlement.

III. Interconnection parameters

To configure data at SoftX3000 side, first negotiate the following interconnection parameters with the opposite office, as shown in Table 2-5.

Table 2-5 Interconnection parameters between SoftX3000 and other SoftSwitch

Serial No.	Parameter	Value
1	Type of signaling used between the offices	H.323
2	National toll area code of office C	0820
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of the opposite SoftSwitch	211.169.150.36/255.255.0.0
5	H.323 CALL port number at SoftX3000 side	1720
6	H.323 CALL port number at the opposite SoftSwitch side	1720

2.3.2 Script

H.323 data is not specific to this configuration. If H.323 data has been configured, it can be used here.

I. Configuring H.323 data

//Add H.323 system configuration, with system name as SoftX3000.

```
ADD H323SYS: SYSNM="SoftX3000";
```

 Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GK, GW or MCU in the H.323 network.

//Add H.323 application-layer configuration. The number of TCP port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

📖 **Note:**

- Because the system is configured with one MSGI, "MSG module type" in the command must be set to "RAS & CALL application".
- For detailed information about port number configuration principles, see Chapter 7, "Configuring Protocol Data", in *U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Guide.*
- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Configuring routing data

//Add an office direction numbered 20 to the office C.

```
ADD OFC: O=20, ON="C_office", DOT=NATT, DOL=HIGH, METHOD=NOCONV;
```


📖 **Note:**

- Supposing the local office is a transit office and the opposite office is a toll office, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be higher than the local office.
- Because this office direction does not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.

//Add a sub-route numbered 20.

```
ADD SRT: SRC=20, O=20, SRN="To C_office", TSM=CYC;
```


//Add a route numbered 20.

```
ADD RT: R=20, RN="To C_office", SR1=20;
```


//Add route analysis data to the office C. The route selection code is 82.

```
ADD RTANA: RSC=82, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=20,
ISUP=H323_M;
```

📖 **Note:**

- Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".
- Because the signaling interconnection between the local office and the opposite office uses the SIP protocol, it is necessary to set the "signaling as prior" parameter in the command to "H.323 select must".

III. Configuring H.323 trunk data

//Add an H.323 trunk group numbered 20.

```
ADD H323TG: TRUNKNO=20, CSC=0, SRT=20, GD=TINOUT, TGNM="To C_office",
RCHSRC=88,      OTCHSRC=99,      TRNKTYPE=TRNK,      TRNKIP="211.169.150.36",
CALLTRNKPORT=1720;
```

📖 **Note:**

- Because destination code charging is used for both incoming and outgoing trunk groups, the parameters "charging source code" and "outgoing trunk charging source" in the command should be set to 88 and 99 respectively, not 255.
- Because what is interconnected with SoftX3000 is a SoftSwitch which is in the same network position, the "H.323 trunk type" parameter in the command must be set to "TRNK", that is, H.323 plain trunk.

IV. Configuring number analysis data

//Add a call prefix 0820.

```
ADD CNACLD: PFX=K'0820, CSA=NTT, RSC=82, MINL=4, MAXL=24, CHSC=0;
```

📖 **Note:**

- Because 0820 is an outgoing call prefix, the "route selection code" parameter in the command is set to 82, not 65535. The parameter has been defined in the command **ADD RTANA**
- Because destination code charging is used for the prefix 0820, the "charging selection code" parameter in the command is set to 0, not 65535.

2.3.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the SoftSwitch office C is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Testing service by making a call

If the network connection is normal, originate a call from the office A to the office C. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:
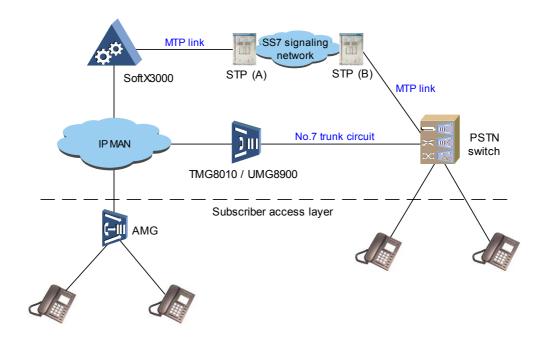
1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST H323TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.

2) Use **LST H323TG** to check whether IP address and H.323 trunk type of the opposite office and other parameters are configured correctly.

3) Check whether data is configured correctly at the opposite side if no data configuration errors are found at SoftX3000 side.

2.4 Configuring Data for Interconnecting with PSTN (MTP – MTP)

2.4.1 Introduction

I. Typical networking model

When SoftX3000 is networked for interworking with the traditional Public Switched Telephone Network (PSTN), Signaling System No. 7 (SS7) is used as the inter-office signaling. For PSTN switch, SS7 signaling is based on MTP links only. For SoftX3000, SS7 can be based on several types of bearers. In the case of MTP links used to carry SS7 signaling at SoftX3000, a typical networking model is illustrated in Figure 2-5.

Figure 2-5 Typical networking model for SoftX3000 interworking with PSTN (MTP – MTP)

As shown in Figure 2-5, SoftX3000 provides MTP links to a Signaling Transfer Point (STP), and through an SS7 signaling network SoftX3000 interworks with the PSTN switch. For voice channels, SoftX3000 interworks with the PSTN switch by controlling a TMG8010. To achieve the interworking between SoftX3000 and PSTN, configure the following interconnection data at SoftX3000 side.

- Interconnection data between SoftX3000 and the TMG8010
- Interconnection data between SoftX3000 and the STP (A)
- Interconnection data between SoftX3000 and the PSTN switch

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two E1 circuits are provided between SoftX3000 and the PSTN switch through the TMG8010.
2) Four 64 kbit/s MTP links are provided between SoftX3000 and the STP (A).
3) Subscribers in the SoftSwitch and subscribers in the PSTN switch can call each other.
4) Destination code charging is used for calls made from the SoftSwitch to the PSTN switch.
5) Destination code charging is used for both incoming and outgoing trunks from the SoftSwitch to the PSTN switch, for inter-office settlement.

III. Interconnection parameters

To configure data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the TMG8010, the STP, and the PSTN switch as shown in Table 2-6, Table 2-7, and Table 2-8.

Table 2-6 Interconnection parameters between SoftX3000 and TMG8010

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and TMG8010	H.248
2	H.248 code type	ABNF (text format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of TMG8010	211.169.150.80/255.255.0.0
5	Local UDP port number of H.248 at SoftX3000 side	2944
6	Local UDP port number of H.248 at TMG8010 side	2944
7	Voice codec types supported by TMG8010	G.711A, G.711③, G.723.1, G.729A
8	Whether TMG8010 supports hairpin connection	Supported
9	Whether TMG8010 supports Echo Cancellation (EC) function	Supported
10	Whether TMG8010 supports T.38 protocol	Supported
11	Numbering plan for E1s at TMG8010	Starting from 0
12	Numbering plan for termination IDs (E1 timeslots) at TMG8010	Starting from 0
13	E1 numbers in No. 7 trunk group at SoftX3000 side	0 ~ 1
14	Corresponding E1 identifiers in No. 7 trunk group at TMG8010 side	0 ~ 1

Table 2-7 Interconnection parameters between SoftX3000 and STP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of STP (A)	001188 (national network)

Serial No.	Parameter	Value	
3	MTP link code	Link 0: 0	Link 1: 1
		Link 2: 2	Link 3: 3
4	MTP link circuit number (at SoftX3000 side)	Link 0: 1	Link 1: 2
		Link 2: 33	Link 3: 34

Table 2-8 Interconnection parameters between SoftX3000 and PSTN switch

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of PSTN switch	1100aa (national network)
3	Type of signaling used for No. 7 trunk	TUP
4	Circuit identification code for No. 7 trunk circuits	0 to 63
5	Selection type for No. 7 trunk circuits	Circuits are selected in a cyclic manner. The local office controls those with an odd number, and the opposite controls those with an even number.

2.4.2 Script

I. Configuring MG data

//Add a TMG8010 with the equipment ID as 211.169.150.80:2944.

```
ADD MGW: EID="211.169.150.80:2944", GWTP=TG, MGWDESC="Shenzhen-TMG8010-02",
MGCMODULENO=23,    LA="191.169.150.30",    RA1="211.169.150.80",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ABNF;
```

 Note:

- When the TMG8010 adopts H.248 protocol, the "equipment ID" parameter in the command is set in the format of "***IP address:Port number***". Here it is set to "211.169.150.80:2944".

- Because the TMG8010 in this example supports hairpin connection function, the "hairpin connection" parameter in this command must be set to "supported". If a TMG8010 does not support hairpin connection function, the parameter is set to "not supported"; otherwise, the call cannot be connected normally.

II. Configuring MTP data

//Add two MTP destination signaling points. The destination signaling point index 10 represents the STP (A) that is connected to SoftX3000 in the associated signaling mode. The destination signaling point index 20 represents the PSTN switch.

```
ADD N7DSP: DPX=10, DPC="001188", DPNAME="STP", STPF=TRUE, ADJF=TRUE;
ADD N7DSP: DPX=20, DPC="1100aa", DPNAME="D_office", STPF=FALSE, ADJF=FALSE;
```

 Note:

- For the STP with the destination signaling point index as 10, both "Adjacent flag" and "STP flag" in the command should be set to "TRUE".

- For the PSTN switch with the destination signaling point index as 20, both "Adjacent flag" and "STP flag" in the command should be set to "FALSE".

//Add an MTP linkset. The index of the MTP linkset is 0. The index of the adjacent signaling point is 10.

```
ADD N7LKS: LSX=0, ASPX=10, LSNAME="To STP";
```

 Note:

Because SoftX3000 and the PSTN switch are interconnected in the quasi-associated signaling mode of SS7, the "adjacent DSP index" parameter in the command must be set to the signaling point index of the STP (A) which is connected to SoftX3000 in the associated signaling mode. Here it is set to 10.

//Add four MTP links. For the link 0, the Signaling Link Code (SLC) is 0 and uses the timeslot 1 of the EPII. For the link 1, the SLC is 1 and uses the timeslot 2 of the EPII. For the link 2, the SLC is 2 and uses the timeslot 33 of the EPII. For the link 3, the SLC is 3 and uses the timeslot 34 of the EPII.

```
ADD N7LNK: MN=23, LNKN=0, LNKNAME="To STP", LNKTYPE=0, TS=1, LSX=0, SLC=0,
SLCS=0;
ADD N7LNK: MN=23, LNKN=1, LNKNAME="To STP", LNKTYPE=0, TS=2, LSX=0, SLC=1,
SLCS=1;
ADD N7LNK: MN=23, LNKN=2, LNKNAME="To STP", LNKTYPE=0, TS=33, LSX=0, SLC=2,
SLCS=2;
ADD N7LNK: MN=23, LNKN=3, LNKNAME="To STP", LNKTYPE=0, TS=34, LSX=0, SLC=3,
SLCS=3;
```

📕 **Note:**

- Because SoftX3000 provides MTP links to the STP, the "link type" parameter in the command must be set to "TDM 64K link".
- The "start circuit number" parameter in the command is set to the timeslot number of the EPII inside SoftX3000.
- MTP links cannot occupy the timeslot 0 (synchronization timeslot) of each E1. That is, the "start circuit number" parameter in the command cannot be 0, 32, 64, 96, 128, 160, 192, or 224.

//Add an MTP route to the PSTN switch. The destination signaling point index is 20.

```
ADD N7RT: LSX=0, DPX=20, RTNAME="To D_office";
```

III. Configuring routing data

//Add an office direction numbered 30 to the PSTN switch. The DPC is 1100aa.

```
ADD  OFC:  O=30,  ON="D_office",  DOT=CMPX,  DOL=HIGH,  DPC1="1100aa",
METHOD=NOCONV;
```

📖 **Note:**

- Supposing the local office is an end office and the opposite office is a transit office, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be higher than the local office.

- Because this office direction has No. 7 trunk circuits, the "DPC" parameter in the command must be set. Otherwise, errors will be encountered when you add a No. 7 trunk group by using the **ADD N7TG** command.

//Add a sub-route numbered 30.

```
ADD SRT: SRC=30, O=30, SRN="To D_office", TSM=CYC;
```

//Add a route numbered 30.

```
ADD RT: R=30, RN="To D_office", SR1=30;
```

//Add route analysis data to the PSTN switch. The route selection code is 83.

```
ADD RTANA: RSC=83, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=30,
ISUP=NOCHG;
```

📖 **Note:**

Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all"

IV. Configuring No. 7 trunk data

//Add No. 7 trunk groups. The trunk group 30 provides outgoing trunks and 31 provides incoming trunks.

```
ADD N7TG: TG=30, EID="211.169.150.80:2944", G=OUT, SRC=30, TGN="To D_office",
CT=TUP, RCHS=88, OTCS=99;
ADD N7TG: TG=31, EID="211.169.150.80:2944", G=IN, SRC=30, TGN="To D_office",
CT=TUP, RCHS=88, OTCS=99;
```

  Note:

- Because destination code charging is used for both incoming and outgoing trunk groups, the parameters "charging source code" and "outgoing trunk charging source" in the command should be set to 88 and 99 respectively, not 255.

- To prevent the peer office from originating incoming calls through the outgoing trunks at the local office side, it is suggested to define the charging source code and outgoing trunk charging source code for both incoming and outgoing trunk groups at the local office side simultaneously.

- Because the signaling type used by the No. 7 trunk is TUP, the "circuit type" parameter in the command must be set to "TUP".

//Add No. 7 trunk circuits. The start CICs are 0 and 32 respectively.

```
ADD N7TKC: MN=23, TG=30, SC=0, EC=31, SCIC=0, SCF=FALSE, TID=0;
ADD N7TKC: MN=23, TG=31, SC=32, EC=63, SCIC=32, SCF=FALSE, TID=32;
```

  Note:

- What is typed in the "start circuit" and "end circuit" parameters in the command is a logical number universally assigned among No. 7, PRA, R2, and V5 E1 trunk circuits in an FCCU/FCSU module inside SoftX3000. The corresponding physical number at the TMG8010 side is specified in the "start circuit termination ID" parameter.

- The absolute value of the difference between start circuit number and start circuit termination ID must be an integral multiple of 32, such as 0, 32, 64, and 96.

V. Configuring number analysis data

//Add a call prefix 0830.

```
ADD CNACLD: PFX=K'0830, CSA=NTT, RSC=83, MINL=4, MAXL=24, CHSC=0;
```

📖 **Note:**

- Because 0830 is an outgoing call prefix, the "route selection code" parameter in the command is set to 83, not 65535.
- Because destination code charging is used for the prefix 0830, the "charging selection code" parameter in the command is set to 0, not 65535.

2.4.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the TMG8010 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the TMG8010 has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the TMG8010 has been registered normally, and then decide the next steps according to the returned result.

1) If "normal" is returned, it indicates that the TMG8010 has been registered and its data configuration is correct.
2) If "disconnect" is displayed, it indicates that the TMG8010 has been registered but is out of service now. In this case, check whether the related data at either side has been modified.
3) If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether the state of the clock is normal

To test MTP links, make sure the clocks of SoftX3000 and the STP keep synchronous. Otherwise, the MTP links cannot work normally. For more information, refer to Chapter 5, "Specialized Configurations", in this manual.

IV. Checking whether the state of the MTP link is normal

Carry out the **DSP N7LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related MTP link is normal. If the state is abnormal, use the **LST N7LNK** command to check whether command parameters are configured correctly, such as module number, link type, start circuit number, signaling link code, and signaling link code send.

V. Checking whether the state of the MTP route is normal

Carry out the **DSP N7RT** command on the U-SYS SoftX3000 Client to check whether the state of the related MTP route is normal. If the state is abnormal, use **LST N7DSP**, **LST N7LKS**, and then **LST N7RT** to check whether the parameter referencing relationship among destination signaling point code, destination signaling point index, and linkset index is correct.

VI. Checking whether the state of the No. 7 trunk circuit is normal

Carry out the **DSP N7C** command on the U-SYS SoftX3000 Client to check whether the state of the related No. 7 trunk circuit is normal. If the state is abnormal, use **LST TG** and then **LST TKC** to check whether command parameters are configured correctly, such as equipment ID, originating point code, destination point code, start CIC, and start circuit termination ID.

VII. Testing service by making a call

If the preceding check indicates normality and correctness, originate a call from the SoftSwitch to the PSTN switch. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:

1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.

2) Check whether data is configured correctly at the opposite side if no data configuration errors are found at SoftX3000 side.

2.5 Configuring Data for Interconnecting with PSTN (M2UA – MTP)

2.5.1 Introduction

I. Typical networking model

When SoftX3000 is networked for interworking with the traditional PSTN, SS7 is used as the inter-office signaling. For PSTN switch, SS7 signaling is based on MTP links only. For SoftX3000, SS7 can be based on several types of bearers. In the case of MTP2-User Adaptation Layer (M2UA) links used to carry SS7 signaling at SoftX3000, a typical networking model is illustrated in Figure 2-6.

Figure 2-6 Typical networking model for SoftX3000 interworking with PSTN (M2UA – MTP)

As shown in Figure 2-6, SoftX3000 provides M2UA links to a UMG8900, and through the UMG8900(with embedded signaling gateway functionality) SoftX3000 interworks with the PSTN switch with regard to SS7. For voice channels, SoftX3000 interworks with the PSTN switch by controlling the UMG8900. To achieve the interworking between SoftX3000 and PSTN, configure the following interconnection data at SoftX3000 side.

- Interconnection data between SoftX3000 and the UMG8900(with embedded signaling gateway functionality)
- Interconnection data between SoftX3000 and the PSTN switch

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two E1 circuits are provided between SoftX3000 and the PSTN switch through the UMG8900.

2) Two M2UA links are provided between SoftX3000 and the UMG8900. Through the UMG8900, two 64 kbit/s MTP links are provided to the PSTN switch. Each M2UA link carries SS7 signaling traffic on one MTP link.

3) Subscribers in the SoftSwitch and subscribers in the PSTN switch can call each other.

4) Destination code charging is used for calls made from the SoftSwitch to the PSTN switch.

5) Destination code charging is used for outgoing trunks from the SoftSwitch to the PSTN switch, for inter-office settlement.

III. Interconnection parameters

To configure data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the UMG8900 and the PSTN switch as shown in Table 2-9 and Table 2-10.

Table 2-9 Interconnection parameters between SoftX3000 and UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248
2	H.248 code type	ASN.1 (binary mode)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of UMG8900 used for H.248 protocol	211.169.150.41/255.255.0.0
5	IP address of UMG8900 used for SIGTRAN protocol	211.169.150.42/255.255.0.0
6	Local UDP port number of H.248 at SoftX3000 side	2944
7	Local UDP port number of H.248 at UMG8900 side	2944
8	Voice codec types supported by UMG8900	G.711A, G.711③, G.723.1, G.729A
9	Whether UMG8900 supports hairpin connection	Supported
10	Whether UMG8900 supports Echo Cancellation (EC) function	Supported

Serial No.	Parameter	Value
11	Whether UMG8900 supports T.38 protocol	Supported
12	Numbering plan for E1s at UMG8900	Starting from 0
13	Numbering plan for termination IDs (E1 timeslots) at UMG8900	Starting from 0
14	E1 numbers in No. 7 trunk group at SoftX3000 side	2 ~ 3
15	Corresponding E1 identifiers in No. 7 trunk group at UMG8900 side	0 ~ 1
16	Local Stream Control Transmission Protocol (SCTP) port number for M2UA link at SoftX3000 side (client)	M2UA link 0: 2904 M2UA link 1: 2910
17	Local SCTP port number for M2UA link at UMG8900 side (server)	2904
18	Interface ID (integer) of MTP link 0	101
19	Interface ID (integer) of MTP link 1	102

Table 2-10 Interconnection parameters between SoftX3000 and PSTN switch

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of PSTN switch	1100bb (national network)
3	MTP link code	Link 0: 0 Link 1: 1
4	Type of signaling used for No. 7 trunk	ISUP
5	Circuit identification code for No. 7 trunk circuits	0 ~ 63
6	Selection type for No. 7 trunk circuits	Circuits are selected in a cyclic manner. The local office controls those with an odd number, and the opposite controls those with an even number.

2.5.2 Script

I. Configuring MG data

//Add a UMG8900 with the equipment ID as 211.169.150.41:2944.

```
ADD MGW: EID="211.169.150.41:2944", GWTP=TG, MGWDESC="Shenzhen-UMG8900-03",
MGCMODULENO=23,    LA="191.169.150.30",    RA1="211.169.150.41",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

 Note:

- When the UMG8900 adopts H.248 protocol, the "equipment ID" parameter in the command is set in the format of "*IP address:Port number*". Here it is set to "211.169.150.41:2944".
- The "remote IP address" in this command must be the one of the UCG8900 used for H.248 protocol, that is, 211.169.150.41.
- Because the UMG8900 in this example supports hairpin connection function, the "hairpin connection" parameter in this command must be set to "supported". If a UMG8900 does not support hairpin connection function, the parameter is set to "not supported"; otherwise, the call cannot be connected normally.
- Because the H.248 protocol of the UMG8900 only supports binary mode, the "Encode Type" in the command must be set as "ASN.1"

II. Configuring M2UA data

//Add an embedded signaling gateway (built in the UMG8900) with the ID 2.

```
ADD ESG: SGID=2, SGNAME="M2UA SG", EID="211.169.150.41:2944"
```

 Note:

Because the signaling gateway is embedded in the UMG8900, what is typed in the "equipment ID" parameter in the command must be the equipment ID of the UMG8900. Here it is set to "211.169.150.41:2944".

//Add two M2UA linksets. The indices of the linksets are 0 and 1 respectively. Integer interface ID is used.

```
ADD  M2LKS:  M2LSX=0,  LSNAME="M2UA  LinkSet  0",  SGID=2,  TM=LOADSHARE,
IFT=INTEGER;
```

```
ADD  M2LKS:  M2LSX=1,  LSNAME="M2UA  LinkSet  1",  SGID=2,  TM=LOADSHARE,
IFT=INTEGER;
```

 📖 **Note:**

- Unless otherwise specified, the traffic mode of the linkset should be set to "Load-share". The traffic mode of the linkset must be the same as that of the SG; otherwise, all M2UA links of the linkset cannot work normally.
- M2UA links in a same M2UA linkset cannot be configured on a same BSGI. To insure the reliability of M2UA links, M2UA links to the same embedded signaling gateway must be allocated on different BSGIs. Therefore, you must configure two M2UA linksets.

//Add two M2UA links. SoftX3000 is a client. The local SCTP port number of link 0 of module 136 is 2904 and that of link 0 of module 137 is 2910. The peer SCTP port number is the default value, 2904.

```
ADD M2LNK: MN=136, LNKN=0, M2LSX=0, LOCPORT=2904, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.42";
ADD M2LNK: MN=137, LNKN=0, M2LSX=1, LOCPORT=2910, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.42";
```

 📖 **Note:**

- The "remote IP address" in this command must be the IP address of the UMG8900 used for the SIGTRAN protocol. That is 211.169.150.42.
- To insure the reliability of the M2UA link, allocate the M2UA links to the same embedded signaling gateway on different BSGI boards.

III. Configuring MTP data

//Add two MTP destination signaling points. The destination signaling point index 30 represents the PSTN switch.

```
ADD N7DSP: DPX=30, DPC="1100bb", DPNAME="E_office", STPF=FALSE, ADJF=TRUE;
```

> 📖 **Note:**
>
> For the PSTN switch with the destination signaling point index as 30, the parameter "STP flag" in the command should be set to "FALSE", but "Adjacent flag" should be set to "TRUE".

//Add an MTP linkset. The index of the MTP linkset is 1. The index of the adjacent signaling point is 30.

```
ADD N7LKS: LSX=1, ASPX=30, LSNAME="To E_office";
```

> 📖 **Note:**
>
> Because SoftX3000 and the PSTN switch are interconnected in the associated signaling mode of SS7, the "adjacent DSP index" parameter in the command must be set to the signaling point index of the PSTN switch. Here it is set to 30.

//Add two MTP links. For the MTP link 0, the SS7 signaling traffic is carried on the M2UA link 0 of module 136, the interface ID is 101, and the signaling link code is 0. For the MTP link 1, the SS7 signaling traffic is carried on the M2UA link 0 of module 137, the interface ID is 102, and the signaling link code is 1.

```
ADD N7LNK: MN=136, LNKN=0, LNKNAME="To E_office", LNKTYPE=2, M2LSX=0,
BINIFID=101, LSX=1, SLC=0, SLCS=0;
ADD N7LNK: MN=137, LNKN=0, LNKNAME="To E_office", LNKTYPE=2, M2LSX=1,
BINIFID=102, LSX=1, SLC=1, SLCS=1;
```

> 📖 **Note:**
>
> - Because SoftX3000 uses M2UA to carry SS7 signaling traffic on MTP links, the "link type" parameter in the command must be set to "M2UA 64kbit/s link".
> - Because SS7 signaling traffic of different MTP links are carried by different M2UA linksets, the "M2UA linkset index" parameter of the two MTP links must not be the same. Here it is set to 0 and 1 respectively.
> - For an MTP link with M2UA to carry SS7 signaling traffic (logical link at SoftX3000 side), its interface ID must be defined. Different MTP links have different (integer) interface IDs.

//Add an MTP route to the PSTN switch. The destination signaling point index is 30.

```
ADD N7RT: LSX=1, DPX=30, RTNAME="To E_office";
```

IV. Configuring routing data

//Add an office direction numbered 40 to the PSTN switch. The DPC is 1100bb.

```
ADD   OFC:   O=40,   ON="E_office",   DOT=CMPX,   DOL=LOW,   DPC1="1100bb",
METHOD=NOCONV;
```

📖 **Note:**

- Supposing the local office is a transit office and the opposite office is an end office, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be lower than the local office.
- Because this office direction has No. 7 trunk circuits, the "DPC" parameter in the command must be set. Otherwise, errors will be encountered when adding a No. 7 trunk group by using the **ADD N7TG** command.

//Add a sub-route numbered 40.

```
ADD SRT: SRC=40, O=40, SRN="To E_office", TSM=CYC;
```

//Add a route numbered 40.

```
ADD RT: R=40, RN="To E_office", SR1=40;
```

//Add route analysis data to the PSTN switch. The route selection code is 84.

```
ADD RTANA: RSC=84, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=40,
ISUP=NOCHG;
```

📖 **Note:**

Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".

V. Configuring No. 7 trunk data

//Add No. 7 trunk groups. The trunk group 40 provides outgoing trunks and 41 provides incoming trunks.

```
ADD N7TG: TG=40, EID="211.169.150.41:2944", G=OUT, SRC=40, TGN="To E_office",
CT=ISUP, RCHS=88, OTCS=99;
```

```
ADD N7TG: TG=41, EID="211.169.150.41:2944", G=IN, SRC=40, TGN="To E_office",
CT=ISUP, RCHS=88, OTCS=99;
```

📖 **Note:**

- Because destination code charging is used for both incoming and outgoing trunk groups, the parameters "charging source code" and "outgoing trunk charging source" in the command should be set to 88 and 99 respectively, not 255.
- To prevent the peer office from originating incoming calls through the outgoing trunks at the local office side, it is suggested to define the charging source code and outgoing trunk charging source code for both incoming and outgoing trunk groups at the local office side simultaneously.
- Because the signaling type used by the No. 7 trunk is ISUP, the "circuit type" parameter in the command must be set to "ISUP".

//Add No. 7 trunk circuits. The start CICs are 0 and 32 respectively.

```
ADD N7TKC: MN=23, TG=40, SC=64, EC=95, SCIC=0, SCF=FALSE, TID=0;
ADD N7TKC: MN=23, TG=41, SC=96, EC=127, SCIC=32, SCF=FALSE, TID=32;
```

📖 **Note:**

- What is typed in the "start circuit" and "end circuit" parameters in the command is a logical number universally assigned among No. 7, PRA, R2, and V5 E1 trunk circuits in an FCCU/FCSU module inside SoftX3000. The corresponding physical number at the UMG8900 side is specified in the "start circuit termination ID" parameter.
- The absolute value of the difference between start circuit number and start circuit termination ID must be an integral multiple of 32, such as 0, 32, 64, and 96.

VI. Configuring number analysis data

//Add a call prefix 0840.

```
ADD CNACLD: PFX=K'0840, CSA=NTT, RSC=84, MINL=4, MAXL=24, CHSC=0;
```

📖 **Note:**

- Because 0840 is an outgoing call prefix, the "route selection code" parameter in the command is set to 84, not 65535. The parameter has been defined in the command **ADD RTANA**.

- Because destination code charging is used for the prefix 0840, the "charging selection code" parameter in the command is set to 0, not 65535.

2.5.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the UMG8900 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the UMG8900has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the UMG8900 has been registered normally, and then decide the next steps according to the returned result.

- If "normal" is returned, it indicates that the UMG8900 has been registered and its data configuration is correct.
- If "disconnect" is displayed, it indicates that the UMG8900 has been registered but is out of service now. In this case, check whether the related data at either side has been modified.
- If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether the state of the M2UA link is normal

Carry out the **DSP M2LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related M2UA link is normal. If the state is abnormal, use the **LST M2LNK** command to check whether command parameters are configured correctly, such as local port number, local IP address, peer port number, and peer IP address.

IV. Checking whether the state of the MTP link is normal

Carry out the **DSP N7LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related MTP link is normal. If the state is abnormal, use the **LST N7LNK** command to check whether command parameters are configured correctly, such as module number, link type, start circuit number, signaling link code, and signaling link code sent.

V. Checking whether the state of the MTP route is normal

Carry out the **DSP N7RT** command on the U-SYS SoftX3000 Client to check whether the state of the related MTP route is normal. If the state is abnormal, use **LST N7DSP**, **LST N7LKS**, and then **LST N7RT** to check whether the parameter referencing relationship among destination signaling point code, destination signaling point index, and linkset index is correct.

VI. Checking whether the state of the No. 7 trunk circuit is normal

Carry out the **DSP N7C** command on the U-SYS SoftX3000 Client to check whether the state of the related No. 7 trunk circuit is normal. If the state is abnormal, use **LST TG** and then **LST TKC** to check whether command parameters are configured correctly, such as equipment ID, originating point code, destination point code, start CIC, and start circuit termination ID.

VII. Testing service by making a call

If the preceding check indicates normality and correctness, originate a call from the SoftSwitch to the PSTN switch. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:
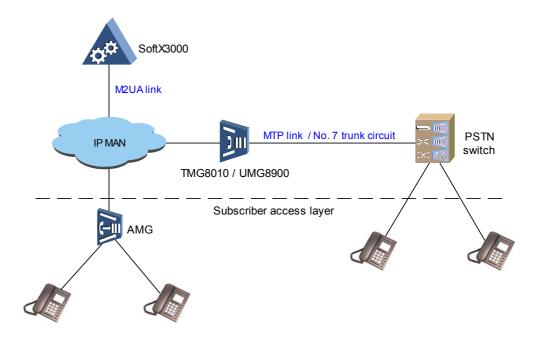
1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.
2) Check whether data is configured correctly at the opposite side if no data configuration errors are found at SoftX3000 side.

2.6 Configuring Data for Interconnecting with PSTN (M3UA – MTP)

2.6.1 Introduction

I. Typical networking model

When SoftX3000 is networked for interworking with the traditional PSTN, SS7 is used as the inter-office signaling. For PSTN switch, SS7 signaling is based on MTP links only. For SoftX3000, SS7 can be based on several types of bearers. In the case of MTP3-User Adaptation Layer (M3UA) links used to carry SS7 signaling at SoftX3000, a typical networking model is illustrated in Figure 2-7.

Figure 2-7 Typical networking model for SoftX3000 interworking with PSTN (M3UA – MTP)

As shown in Figure 2-7, SoftX3000 provides M3UA links to an SG7000, and through the SG7000 SoftX3000 interworks with the PSTN switch. For voice channels, SoftX3000 interworks with the PSTN switch by controlling a UMG8900. To achieve the interworking between SoftX3000 and PSTN, configure the following interconnection data at SoftX3000 side.

- Interconnection data between SoftX3000 and the UMG8900
- Interconnection data between SoftX3000 and the SG7000
- Interconnection data between SoftX3000 and the PSTN switch

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two E1 circuits are provided between SoftX3000 and the PSTN switch through the UMG8900.

2) Two M3UA links are provided between SoftX3000 and the SG7000. SS7 signaling traffic is shared between the links.

3) Subscribers in the SoftSwitch and subscribers in the PSTN switch can call each other.

4) Destination code charging is used for calls made from the SoftSwitch to the PSTN switch.

5) Destination code charging is used for outgoing trunks from the SoftSwitch to the PSTN switch, for inter-office settlement.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the UMG8900, the SG7000, and the PSTN switch as shown in Table 2-11, Table 2-12, and Table 2-13.

Table 2-11 Interconnection parameters between SoftX3000 and UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248
2	H.248 code type	ASN.1 (binary mode)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of UMG8900 used for the H.248 protocol	211.169.150.43/255.255.0.0
5	IP address of UMG8900 used for the SIGTRAN protocol	211.169.150.44/255.255.0.0
6	Local UDP port number of H.248 at SoftX3000 side	2944
7	Local UDP port number of H.248 at UMG8900 side	2944
8	Voice codec types supported by UMG8900	G.711A, G.711③, G.723.1, G.729A
9	Whether UMG8900 supports hairpin connection	Supported
10	Whether UMG8900 supports Echo Cancellation (EC) function	Supported
11	Whether UMG8900 supports T.38 protocol	Supported

Serial No.	Parameter	Value
12	Numbering plan for E1s at UMG8900	Starting from 0
13	Numbering plan for termination IDs (E1 timeslots) at UMG8900	Starting from 0
14	E1 numbers in No. 7 trunk group at SoftX3000 side	4 ~ 5
15	Corresponding E1 identifiers in No. 7 trunk group at UMG8900 side	0 ~ 1

Table 2-12 Interconnection parameters between SoftX3000 and SG7000

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of SG7000	211.169.150.70/255.255.0.0
3	Signaling point code of SoftX3000	001122 (national network)
4	Signaling point code of SG7000	001177 (national network)
5	Local SCTP port number for M3UA link at SoftX3000 side (client)	M3UA link 0: 2905 M3UA link 1: 2911
6	Local SCTP port number for M3UA link at SG7000 side (server)	2905
7	Routing context (SoftX3000 acts as an application server.)	333777

Table 2-13 Interconnection parameters between SoftX3000 and PSTN switch

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of PSTN switch	1100cc (national network)
3	Type of signaling used for No. 7 trunk	ISUP
4	Circuit identification code for No. 7 trunk circuits	0 ~ 63
5	Selection type for No. 7 trunk circuits	Circuits are selected in a cyclic manner. The local office controls those with an odd number, and the opposite controls those with an even number.

2.6.2 Script

I. Configuring MG data

//Add a UMG8900 with the equipment ID as 211.169.150.43:2944.

```
ADD MGW: EID="211.169.150.43:2944", GWTP=TG, MGWDESC="ShenZhen-UMG8900-04",
MGCMODULENO=23,    LA="191.169.150.30",    RA1="211.169.150.43",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

📖 **Note:**

- When the UMG8900 adopts H.248 protocol, the "equipment ID" parameter in the command is set in the format of "*IP address:Port number*". Here it is set to "211.169.150.43:2944".
- The "remote IP address " in this command must be the one of the UMG8900 used for the H.248 protocol. That is 211.169.150.43.
- Because the UMG8900 in this example supports hairpin connection function, the "hairpin connection" parameter in this command must be set to "supported". If a UMG8900 does not support hairpin connection function, the parameter is set to "not supported"; otherwise, the call cannot be connected normally.
- Because the H.248 protocol of the UMG8900 only supports the binary mode, the "Encode Type" in this command must be "ASN.1".

II. Configuring M3UA data

//Add an M3UA local entity. The index of the local entity is 0. The originating point code is 001122. The routing context is 333777.

```
ADD M3LE: LEX=0, LENAME="SoftX3000", OPC="001122", LET=AS, RC=333777;
```

📖 **Note:**

The routing context may be a decimal number or null (not configured). It should be negotiated with the SG7000.

//Add two M3UA destination entities. The destination entity index 10 represents the SG7000 connected to SoftX3000 in the associated signaling mode, and 20 represents the PSTN switch.

```
ADD M3DE: DEX=10, DENAME="SG7000", DPC="001177", STPF=TRUE, DET=SG, ADJF=YES;
```

```
ADD M3DE: DEX=20, DENAME="PSTN Switch", DPC="1100cc", STPF=FALSE, DET=SP;
```

📕 **Note:**

- Because SoftX3000 is networked with the SG7000 in a non-peer-to-peer mode and the entity type of SoftX3000 is Application Server (AS), the entity type of the SG7000 must be set to "SG".
- Because the interworking of SS7 signaling is achieved between SoftX3000 and the PSTN switch through the SG7000, the destination entity type of the PSTN switch must be set to "SP".
- Because the SG7000 has the signaling transfer function on the signaling network, the STP flag must be set to "TRUE". Otherwise, errors will be encountered when you add an M3UA route by using the **ADD M3RT** command.

//Add an M3UA linkset. The index of the linkset is 0. The index of the adjacent entity is 10.

```
ADD M3LKS: LSX=0, LSNAME="To SG7000", ADX=10, TM=LOADSHARE, WM=ASP;
```

📕 **Note:**

- Because there are M3UA signaling links in associated signaling mode between SoftX3000 and the SG7000, what is typed in the "adjacent entity index" parameter in the command should be the destination entity index of the SG7000. Here it is set to 10.
- Because SoftX3000 and the SG7000 are networked in a non-peer-to-peer mode and SoftX3000 acts as an AS, the "work mode" parameter in the command must be set to "ASP".
- The traffic mode of the linkset must be the same as that of the SG; otherwise, all M3UA links of the linkset cannot work normally. Unless otherwise specified, the traffic mode of the linkset should be set to "Load-share".

//Add two M3UA links. SoftX3000 is a client. The local SCTP port number of link 0 of module 136 is 2905 and that of link 0 of module 137 is 2911. The peer SCTP port number is the default value, 2905.

```
ADD M3LNK: MN=136, LNKN=0, LNKNAME="To SG7000 #0", LOCIP1="191.169.150.30",
LOCPORT=2905, PEERIP1="211.169.150.44", PEERPORT=2905, CS=C, LSX=0;
ADD M3LNK: MN=137, LNKN=0, LNKNAME="To SG7000 #1", LOCIP1="191.169.150.30",
LOCPORT=2911, PEERIP1="211.169.150.44", PEERPORT=2905, CS=C, LSX=0;
```

📖 **Note:**

● Allocate M3UA links that direct to a same destination signaling point in different
  BSGIs to ensure the reliability of the M3UA links.

//Add an M3UA route to the PSTN switch. The destination entity index is 20.

```
ADD M3RT: RTNAME="To F_office", DEX=20, LSX=0;
```

III. Configuring routing data

//Add an office direction numbered 50 to the PSTN switch. The DPC is 1100cc.

```
ADD  OFC:  O=50,  ON="F_office",  DOT=CMPX,  DOL=HIGH,  DPC1="1100cc",
METHOD=NOCONV;
```

📖 **Note:**

● Supposing the local office and the opposite office are both gateway offices, to avoid
  alternative routing between the offices of the same level, the level of the opposite
  office should be set to be higher than the local office.
● Because this office direction has No. 7 trunk circuits, the "DPC" parameter in the
  command must be set. Otherwise, errors will be encountered when you add a No. 7
  trunk group by using the **ADD N7TG** command.

//Add a sub-route numbered 50.

```
ADD SRT: SRC=50, O=50, SRN="To F_office", TSM=CYC;
```

//Add a route numbered 50.

```
ADD RT: R=50, RN="To F_office", SR1=50;
```

//Add route analysis data to the PSTN switch. The route selection code is 85.

```
ADD RTANA: RSC=85, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=50,
ISUP=NOCHG;
```

📖 **Note:**

Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".

IV. Configuring No. 7 trunk data

//Add No. 7 trunk groups. The trunk group 50 provides outgoing trunks and 51 provides incoming trunks.

```
ADD N7TG: TG=50, EID="211.169.150.43:2944", G=OUT, SRC=50, TGN="To F_office",
CT=ISUP, RCHS=88, OTCS=99;
ADD N7TG: TG=51, EID="211.169.150.43:2944", G=IN, SRC=50, TGN="To F_office",
CT=ISUP, RCHS=88, OTCS=99;
```

📖 **Note:**

- Because destination code charging is used for both incoming and outgoing trunk groups, the parameters "charging source code" and "outgoing trunk charging source" in the command are set to 88 and 99 respectively, not 255.
- To prevent the peer office from originating incoming calls through the outgoing trunks at the local office side, it is suggested to define the charging source code and outgoing trunk charging source code for both incoming and outgoing trunk groups at the local office side simultaneously.
- Because the signaling type used by the No. 7 trunk is ISUP, the "circuit type" parameter in the command must be set to "ISUP".

//Add No. 7 trunk circuits. The start CICs are 0 and 32 respectively.

```
ADD N7TKC: MN=23, TG=50, SC=128, EC=159, SCIC=0, SCF=FALSE, TID=0;
ADD N7TKC: MN=23, TG=51, SC=160, EC=191, SCIC=32, SCF=FALSE, TID=32;
```

📖 **Note:**

● What is typed in the "start circuit" and "end circuit" parameters in the command is a logical number universally assigned among No. 7, PRA, R2, and V5 E1 trunk circuits in an FCCU/FCSU module inside SoftX3000. The corresponding physical number at the UMG8900 side is specified in the "start circuit termination ID" parameter.

● The absolute value of the difference between start circuit number and start circuit termination ID must be an integral multiple of 32, such as 0, 32, 64, and 96.

V. Configuring number analysis data

//Add a call prefix 0850.

```
ADD CNACLD: PFX=K'0850, CSA=NTT, RSC=85, MINL=4, MAXL=24, CHSC=0;
```

📖 **Note:**

● Because 0850 is an outgoing call prefix, the "route selection code" parameter in the command is set to 85, which is defined in the command **ADD RTANA**, not 65535.

● Because destination code charging is used for the prefix 0850, the "charging selection code" parameter in the command is set to 0, not 65535.

2.6.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the UMG8900 is normal and whether the network connection between SoftX3000 and the SG7000 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the UMG8900has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the UMG8900 has been registered normally, and then decide the next steps according to the returned result.

1) If "normal" is returned, it indicates that the UMG8900 has been registered and its data configuration is correct.

2) If "disconnect" is displayed, it indicates that the UMG8900 has been registered but is out of service now. In this case, check whether the related data at either side has been modified.

3) If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether such parameters as equipment ID, peer IP address, peer port number, and code type are correctly configured.

III. Checking whether the state of the M3UA link is normal

Carry out the **DSP M3LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related M3UA link is normal. If the state is abnormal, use the command **LST M3LKS** to check whether the traffic mode of the linkset is configured correctly, and then use the **LST M3LNK** command to check whether command parameters are configured correctly, such as local port number, local IP address, peer port number, peer IP address, and C/S mode.

IV. Checking whether the state of the M3UA route is normal

Carry out the **DSP M3RT** command on the U-SYS SoftX3000 Client to check whether the state of the related M3UA route is normal. If the state is abnormal, use **LST M3LE**, **LST M3DE**, and then **LST M3LKS** to check whether the parameter referencing relationship among local entity index, destination entity index, and linkset index is configured correctly.

V. Checking whether the state of the No. 7 trunk circuit is normal

Carry out the **DSP N7C** command on the U-SYS SoftX3000 Client to check whether the state of the related No. 7 trunk circuit is normal. If the state is abnormal, use **LST TG** and then **LST TKC** to check whether command parameters are configured correctly, such as equipment ID, originating point code, destination point code, start CIC, and start circuit termination ID.

VI. Testing service by making a call

If the preceding check indicates normality and correctness, originate a call from the SoftSwitch to the PSTN switch. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:
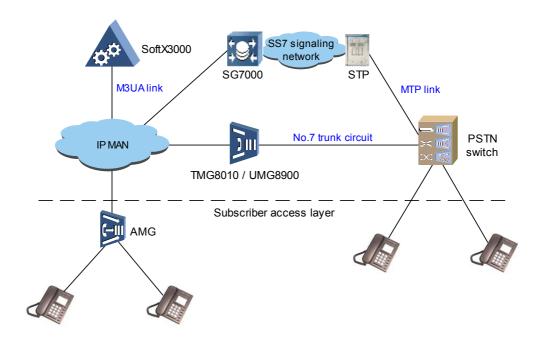
1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.

2) Check whether data is configured correctly at the opposite side if no data configuration errors are found at SoftX3000 side.

2.7 Configuring Data for Interconnecting with H.323 Network (GK – GW)

2.7.1 Introduction

I. Typical networking model

When interworking with the traditional H.323 network, SoftX3000 can act as either a GateKeeper (GK) or a GateWay (GW). In the case that SoftX3000 acts as a GK (only supporting routing calls) and the opposite device as a GW (for example, A8010 Expert) on the same H.323 network, a typical networking model is illustrated in Figure 2-8.

Figure 2-8 Typical networking model for SoftX3000 interworking with H.323 network (GK – GW)

As shown in Figure 2-8, the coverage of SoftX3000 is called "area". In the area, SoftX3000 is responsible for subscriber address resolution and authentication, provides routing information for controlled gateways, and implements call connection and release functions. What need to be done is to configure the interconnection data between SoftX3000 and H.323 gateways in such a networking model

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Subscribers in the office A and subscribers in the office B can call each other.

2) Destination code charging is used for calls made from the office A to the office B, that is, destination code charging is used for the incoming trunks from the office A to SoftX3000.

3)   Destination code charging is used for calls made from the office B to the office A, that is, destination code charging is used for the incoming trunks from the office B to SoftX3000.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the A8010 Expert (that is, H.323 gateway), as shown in Table 2-14.

Table 2-14 Interconnection parameters between SoftX3000 and A8010 Expert

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	National toll area code of office A	0711
3	National toll area code of office B	0722
4	Gateway alias of A8010 Expert to office A	office_a
5	Gateway alias of A8010 Expert to office B	office_b

2.7.2 Script

H.323 data is not specific to this configuration. If H.323 data has been configured, it can be used here.

I. Configuring H.323 data

//Add H.323 system configuration, with system name as SoftX3000.

```
ADD H323SYS: SYSNM="SoftX3000";
```

 Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GK, GW or MCU in the H.323 network.

//Add H.323 application-layer configuration. The number of TCP port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

 Note:

- Because the system is configured with one MSGI, "MSG module type" in the command must be set to "RAS & CALL application".

- For detailed information about port number configuration principles, see Chapter 7, "Configuring Protocol Data", in *U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Guide.*

- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Configuring routing data

//Add an office direction numbered 71 to the office A and an office direction numbered 72 to the office B.

```
ADD OFC: O=71, ON="A_office", DOT=CMPX, DOL=LOW, METHOD=NOCONV;
ADD OFC: O=72, ON="B_office", DOT=CMPX, DOL=LOW, METHOD=NOCONV;
```

 Note:

- Supposing the local office acts as a GK and the offices A and B are both end offices, to avoid alternative routing between the offices of the same level, the level of the offices A and B is set to be lower than the local office.

- Because both office directions in this example do not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.

//Add a sub-route numbered 71 to the office A and a sub-route numbered 72 to the office B.

```
ADD SRT: SRC=71, O=71, SRN="To A_office", TSM=CYC;
ADD SRT: SRC=72, O=72, SRN="To B_office", TSM=CYC;
```

//Add a route numbered 71 to the office A and a route numbered 72 to the office B.

```
ADD RT: R=71, RN="To A_office", SR1=71;
ADD RT: R=72, RN="To B_office", SR1=72;
```

//Add route analysis data. The route selection code to the office A is 71 and the route selection code to the office B is 72.

```
ADD RTANA: RSC=71, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=71,
ISUP=H323_M;
ADD RTANA: RSC=72, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=72,
ISUP=H323_M;
```

 Note:

- Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".
- Because the signaling interconnection between the local office and the opposite office uses the H.323 protocol, the "signaling as prior" parameter in the command is set to "H323 select must".

III. Configuring H.323 trunk data

//Add an H.323 trunk group numbered 71 to the office A with the gateway alias office_a and an H.323 trunk group numbered 72 to the office B with the gateway alias office_b.

```
ADD H323TG: TRUNKNO=71, CSC=0, SRT=71, GD=TINOUT, TGNM="To A_office",
RCHSRC=88, TRNKTYPE=GW, CCMID=23, EID=" office_a";
ADD H323TG: TRUNKNO=72, CSC=0, SRT=72, GD=TINOUT, TGNM="To B_office",
RCHSRC=88, TRNKTYPE=GW, CCMID=23, EID=" office_b";
```

 Note:

- Because destination code charging is used for the incoming trunk groups, the "charging source code" parameter in the command is set to 88 for both, not 255.
- Because what is interconnected to SoftX3000 is H.323 gateway, the "H.323 trunk type" parameter in the command must be set to "GW", that is, H.323 GW trunk.

IV. Configuring number analysis data

//Add a call prefix 0711 to the office A and a call prefix 0722 to the office B.

```
ADD CNACLD: PFX=K'0711, CSA=NTT, RSC=71, MINL=4, MAXL=24, CHSC=0;
ADD CNACLD: PFX=K'0722, CSA=NTT, RSC=72, MINL=4, MAXL=24, CHSC=0;
```

📖 **Note:**

- Because 0711 and 0722 are outgoing call prefixes, the "route selection code" parameter in the command is set to 71 and 72 respectively, not 65535.
- Because destination code charging is used for the prefixes 0711 and 0722, the "charging selection code" parameter in the command is set to 0 for both, not 65535.

2.7.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and each of the A8010 Experts is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether each of the A8010 Experts has been registered normally

Carry out the **DSP EPST** command on the U-SYS SoftX3000 Client to check whether each of the A8010 Experts has been registered normally, and then decide the next steps according to the returned result.

1) If "Register" is returned, it indicates that the A8010 Expert has been registered and its data configuration is correct.

2) If "unregister" is displayed, it indicates that the A8010 Expert cannot be registered successfully. Use the **LST H323TG** command to check whether the "GW alias" parameter is configured correctly. If no data configuration errors are found at the SoftX3000 side, check whether GK data is correctly configured at the A8010 Expert side.

III. Testing service by making a call

If each of the A8010 Experts is registered successfully, make a call between subscribers in the offices A and B to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,

1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST H323TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.
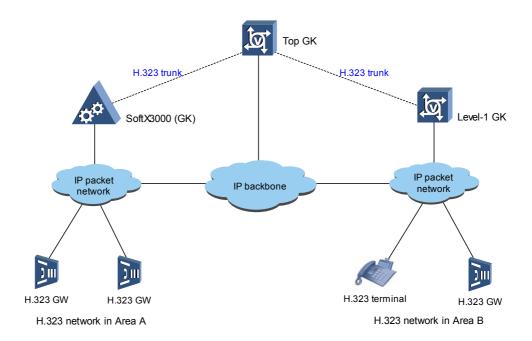
2)   Check whether data is configured correctly at the opposite side if no data configuration errors are found at SoftX3000 side.

2.8 Configuring Data for Interconnecting with H.323 Network (GK – Higher Level GK)

2.8.1 Introduction

I. Typical networking model

When interworking with the traditional H.323 network, SoftX3000 can act as either a GateKeeper (GK) or a GateWay (GW). When SoftX3000 acts as a level-1 GK in a two-level network and the opposite device is a top GK on the same H.323 network (or a GK on a different H.323 network), a typical networking model is illustrated in Figure 2-9.

Figure 2-9 Typical networking model for SoftX3000 interworking with H.323 network (GK – Upper-level GK)

As shown in Figure 2-9, the top GK implements address resolution, call setup, and call release between SoftX3000 and other level-1 GK. What need to be done is to configure the interconnection data between SoftX3000 and the top GK in such a networking model.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Subscribers in the area A and subscribers in the area B can call each other.

2) Destination code charging is used for calls made from the area A to the area B, that is, destination code charging is used for the outgoing trunks from SoftX3000 to the top GK.

3) Destination code charging mode is adopted for the calls from the area B to the area A, that is, destination code charging mode is used for the incoming trunks from the top GK to SoftX3000.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the top GK, as shown in Table 2-15.

Table 2-15 Interconnection parameter between SoftX3000 and top GK

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of top GK	211.169.150.1/255.255.0.0
3	H.323 RAS port number at SoftX3000 side	1719
4	H.323 RAS port number at top GK side	1719
5	National toll area code of area B	073X, 074X

2.8.2 Script

H.323 data is not specific to this configuration. If H.323 data has been configured, it can be used here.

I. Configuring H.323 data

//Add H.323 system configuration, with system name as SoftX3000.

```
ADD H323SYS: SYSNM="SoftX3000";
```

Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GK, GW or MCU in the H.323 network.

//Add H.323 application-layer configuration. The number of TCP port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

 Note:

- Because the system is configured with one MSGI, "MSG module type" in the command must be set to "RAS & CALL application".
- For detailed information about port number configuration principles, see Chapter 7, "Configuring Protocol Data", in *U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Guide.*
- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Configuring routing data

//Add an office direction numbered 73 to the area B.

```
ADD OFC: O=73, ON="B_area", DOT=CMPX, DOL=HIGH, METHOD=NOCONV;
```

 Note:

- Supposing the local office is an end office and the opposite office is a toll office, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be higher than the local office.
- Because this office direction does not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.

//Add a sub-route numbered 73.

```
ADD SRT: SRC=73, O=73, SRN="To B_area", TSM=CYC;
```

//Add a route numbered 73.

```
ADD RT: R=73, RN="To B_area", SR1=73;
```

//Add route analysis data to the area B. The route selection code is 73.

```
ADD RTANA: RSC=73, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=73,
ISUP=H323_M;
```

 Note:

- Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".
- Because the signaling interconnection between the local office and the opposite office uses the H.323 protocol, the "signaling as prior" parameter in the command is set to "H323 select must".

III. Configuring H.323 trunk data

//Add an H.323 trunk group between the local GK and the top GK, which is numbered 73.

```
ADD H323TG: TRUNKNO=73, CSC=0, SRT=73, GD=TINOUT, TGNM="To B_area", RCHSRC=88,
OTCHSRC=99, TRNKTYPE=GK, TRNKIP="211.169.150.1", RASTRNKPORT=1719;
```

 Note:

- Because destination code charging is used for both incoming and outgoing trunk groups, the parameters "charging source code" and "outgoing trunk charging source" in the command should be set to 88 and 99 respectively, not 255.
- Because SoftX3000 acts as a level-1 GK and what's interconnected to SoftX3000 is a top GK, the "H.323 trunk type" parameter in the command must be set to GK, that is, H.323 GK trunk.

IV. Configuring number analysis data

//Add call prefixes 073 and 074.

```
ADD CNACLD: PFX=K'073, CSA=NTT, RSC=73, MINL=4, MAXL=24, CHSC=0;
ADD CNACLD: PFX=K'074, CSA=NTT, RSC=73, MINL=4, MAXL=24, CHSC=0;
```

 Note:

- Because 073 and 074 are outgoing call prefixes, the "route selection code" parameter in the command is set to 73 for both, not 65535.
- Because destination code charging is used for the prefixes 073 and 074, the "charging selection code" parameter in the command is set to 0 for both, not 65535.

V. Optional configurations

In actual networking, if a GK in the area B does not support Q.931 protocol and the peer GK originates an incoming call, this GK will instruct the GW under its control to interact Q.931 messages with SoftX3000 directly after it exchanges RAS messages with SoftX3000. In this case, SoftX3000 cannot match "call source code" and "charging source code" for this incoming call, so that the charging and authentication at the local office will fail. To solve this problem, you need to configure a virtual H.323 trunk from this GW to SoftX3000.

//Add an office direction to the area B, with office direction number as 74.

```
ADD OFC: O=74, ON="B_area", DOT=CMPX, DOL=HIGH, METHOD=NOCONV;
```

📕 **Note:**

When H.323 trunks are contained in an office direction, only one H.323 trunk group can be defined for this office direction. In this case, different office directions and sub-routes must be defined for different H.323 trunks.

//Add a sub-route numbered 74.

```
ADD SRT: SRC=74, O=74, SRN="To B_area", TSM=CYC;
```

//Add a virtual IP list, with IP list number as 0 and IP address of the H.323 GW as 211.169.150.14.

```
ADD IPLIST: IPLISTNO=0, IP="211.169.150.14", MSK="255.255.0.0";
```

//Add an H.323 incoming trunk group from the H.323 GW in the area B to the local GK, with trunk group number as 74, call source code as 0 and charging source code as 88.

```
ADD H323TG: TRUNKNO=74, CSC=0, SRT=74, GD=TIN, TGNM="To B_area", RCHSRC=88,
TRNKTYPE=VT, VEDIOS=SUPPORT, IPLISTNO=0;
```

📕 **Note:**

Set the parameter "H.323 trunk type" in the command to "VT", that is , virtual H.323 trunk.

2.8.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the top GK is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Testing service by making a call

If the network connection is normal, originate a call from the area A to the area B. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:

1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST H323TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.
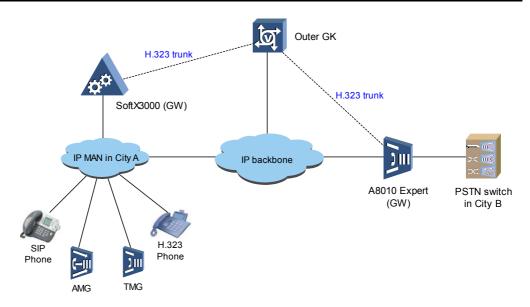
2) Check whether data is configured correctly at the top GK side if no data configuration errors are found at SoftX3000 side.

2.9 Configuring Data for Interconnecting with H.323 Network (GW – Outer GK)

2.9.1 Introduction

I. Typical networking model

When interworking with the traditional H.323 network, SoftX3000 can act as either a GateKeeper (GK) or a GateWay (GW). When SoftX3000 acts as a GW on the H.323 network and the opposite device is an outer GK, a typical networking model is illustrated in Figure 2-10.

Figure 2-10 Typical networking model for SoftX3000 interworking with H.323 network (GW – outer GK)

As shown in Figure 2-10, SoftX3000 acts as an H.323 GW logically. That is, SoftX3000 along with all controlled media gateway devices and terminal devices is regarded as a logical H.323 gateway. What needs to be done is to configure the interconnection data between SoftX3000 and the outer GK in such a networking model.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Subscribers in the office A and subscribers in the office B can call each other.
2) Destination code charging is used for calls made from the office A to the office B.
3) Destination code charging is used for outgoing trunks from the office A to the office B, for inter-office settlement.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the outer GK side, as shown in Table 2-16.

Table 2-16 Interconnection parameters between SoftX3000 and outer GK

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of outer GK	211.169.150.2/255.255.0.0
3	H.323 RAS port number at SoftX3000 side	1719

Serial No.	Parameter	Value
4	H.323 RAS port number at outer GK side	1719
4	Alias of SoftX3000 acting as H.323 gateway	SoftX3000
5	Alias of outer GK (optional)	outGK
6	National toll area code of office A	0755
7	National toll area code of office B	0860

2.9.2 Script

H.323 data is not specific to this configuration. If H.323 data has been configured, it can be used here. Note that a key interconnection parameter, "gateway alias", of SoftX3000 acting as an H.323 gateway must be correctly defined here.

I. Configuring H.323 data

//Add H.323 system configuration, with system name as SoftX3000.

```
ADD H323SYS: SYSNM="SoftX3000";
```

 Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GK, GW or MCU in the H.323 network.

//Add H.323 application-layer configuration. The number of TCP port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

📖 **Note:**

- Because the system is configured with one MSGI, "MSG module type" in the command must be set to "RAS & CALL application".
- For detailed information about port number configuration principles, see Chapter 7, "Configuring Protocol Data", in U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Guide.
- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Configuring routing data

//Add an office direction numbered 60 to the office B.

```
ADD OFC: O=60, ON="B_office", DOT=CMPX, DOL=LOW, METHOD=NOCONV;
```

📖 **Note:**

- Supposing the local office is a toll office and the opposite office is an end office, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be lower than the local office.
- Because this office direction does not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.

//Add a sub-route numbered 60.

```
ADD SRT: SRC=60, O=60, SRN="To B_office", TSM=CYC;
```

//Add a route numbered 60.

```
ADD RT: R=60, RN="To B_office", SR1=60;
```

//Add route analysis data to the office B. The route selection code is 86.

```
ADD RTANA: RSC=86, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=60,
ISUP=H323_M;
```

📖 Note:

Because the signaling interconnection between the local office and the opposite office uses the H.323 protocol, the "signaling as prior" parameter in the command is set to "H323 select must".

III. Configuring H.323 trunk data

//Add an H.323 trunk group numbered 60.

```
ADD H323TG: TRUNKNO=60, CSC=0, SRT=60, GD=TINOUT, TGNM="To B_office",
OTCHSRC=99, TRNKTYPE=OGK, TRNKIP="211.169.150.2", RASTRNKPORT=1719, EN="H323
GK", ET=PRGK, GKID="outGK";
```

📖 Note:

- Because destination code charging is used for the outgoing trunk group, the "outgoing trunk charging source" parameter in the command is set to 99, not 255.
- Because SoftX3000 acts as an H.323 gateway and what's interconnected to SoftX3000 is an outer GK, the "H.323 trunk type" parameter in the command must be set to OGK, that is, H.323 OuterGK trunk.

IV. Configuring number analysis data

//Add a call prefix 0860.

```
ADD CNACLD: PFX=K'0860, CSA=NTT, RSC=86, MINL=4, MAXL=24, CHSC=0;
```

📖 Note:

- Because 0860 is an outgoing call prefix, the "route selection code" parameter in the command is set to 86, not 65535.
- Because destination code charging is used for the prefix 0860, the "charging selection code" parameter in the command is set to 0, not 65535.

2.9.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the outer GK is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether SoftX3000 has been registered normally at outer GK

Carry out the **DSP GW** command on the U-SYS SoftX3000 Client to check whether SoftX3000 has been registered normally at outer GK, and then decide the next steps according to the returned result.

1) If "Register" is returned, it indicates that SoftX3000 has been registered and its data configuration is correct.
2) If "Unregister" is displayed, it indicates that SoftX3000 cannot be registered successfully. Use the **REG GW** command to register SoftX3000 at the outer GK and then use the **DSP GW** command to query whether SoftX3000 has been registered successfully.
3) If "Unregister" is displayed still, it indicates that the interconnection between them is abnormal. Use the **LST H323TG** command to check whether parameters are configured correctly such as trunk IP address, entity alias, and RAS port number.

III. Testing service by making a call

If the network connection is normal, originate a call from the office A to the office B. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:
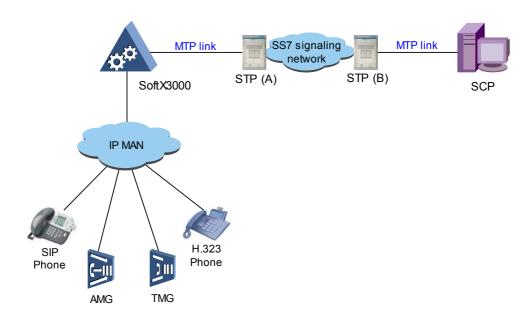
1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and then **LST H323TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.
2) Check whether data is configured correctly at the outer GK side if no data configuration errors are found at SoftX3000 side.

2.10 Configuring Data for Interconnecting with SCP (MTP – MTP)

2.10.1 Introduction

I. Typical networking model

To configure Intelligent Network (IN) service data, signaling data for interconnection between SoftX3000 and Service Control Point (SCP) must have been configured. Otherwise, IN services cannot be deployed. When Intelligent Network Application Protocol (INAP) signaling at SoftX3000 side and SCP side is all carried over MTP link, a typical networking model is illustrated in Figure 2-11.

Figure 2-11 Typical networking model for SoftX3000 interconnected with SCP (MTP – MTP)

As shown in Figure 2-11, SoftX3000 provides MTP links to an STP and, across an SS7 signaling network, interworks INAP signaling with the SCP. To achieve the interconnection of signaling between SoftX3000 and SCP, configure the following interconnection data at SoftX3000 side.

- Signaling data for interconnection between SoftX3000 and the STP (A)
- Signaling data for interconnection between SoftX3000 and the SCP

If the SCP in the actual networking application is provided by Huawei, the device that provides MTP links at the SCP side is the SAU (or USAU) of Huawei. Accordingly, the configuration of signaling interconnection data between SoftX3000 and the SCP is

actually the configuration of signaling interconnection data between SoftX3000 and the SAU (or USAU).

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Four 64 kbit/s MTP links are provided between SoftX3000 and the STP (A).
2) Signaling Connection Control Part (SCCP) connection can be set up between SoftX3000 and the SCP.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the STP and SCP sides, as shown in Table 2-17 and Table 2-18.

Table 2-17 Interconnection parameters between SoftX3000 and STP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of STP (A)	001188 (national network)
3	MTP link code (at SoftX3000 side)	Link 0: 0 Link 1: 1 Link 2: 2 Link 3: 3
4	MTP link circuit number (at SoftX3000 side)	Link 0: 1 Link 1: 2 Link 2: 33 Link 3: 34

Table 2-18 Signaling interconnection parameters between SoftX3000 and SCP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of SCP	110a0a (national network)
3	Subsystem number between SoftX3000 and SCP	SCMG, INAP

2.10.2 Script

I. Configuring MTP data

//Add two MTP destination signaling points. The destination signaling point index 10 represents the STP (A) that is connected to SoftX3000 in the associated signaling mode. The destination signaling point index 50 represents the SCP.

```
ADD N7DSP: DPX=10, DPC="001188", DPNAME="STP", STPF=TRUE, ADJF=TRUE;
ADD N7DSP: DPX=50, DPC="110a0a", DPNAME="SCP", STPF=FALSE, ADJF=FALSE;
```

  Note:

- For the STP with the destination signaling point index as 10, both "Adjacent flag" and "STP flag" in the command should be set to "TRUE".
- For the SCP with the destination signaling point index as 50, both "Adjacent flag" and "STP flag" in the command should be set to "FALSE".

//Add an MTP linkset. The index of the MTP linkset is 0. The index of the adjacent signaling point is 10.

```
ADD N7LKS: LSX=0, ASPX=10, LSNAME="To STP";
```

  Note:

Because SoftX3000 and the SCP are interconnected in the quasi-associated signaling mode of SS7, the "adjacent DSP index" parameter in the command must be set to the signaling point index of the STP (A) which is connected to SoftX3000 in the associated signaling mode. Here it is set to 10.

//Add four MTP links. For the link 0, the Signaling Link Code (SLC) is 0 and uses the timeslot 1 of the EPII. For the link 1, the SLC is 1 and uses the timeslot 2 of the EPII. For the link 2, the SLC is 2 and uses the timeslot 33 of the EPII. For the link 3, the SLC is 3 and uses the timeslot 34 of the EPII.

```
ADD N7LNK: MN=23, LNKN=0, LNKNAME="To STP", LNKTYPE=0, TS=1, LSX=0, SLC=0,
SLCS=0;
ADD N7LNK: MN=23, LNKN=1, LNKNAME="To STP", LNKTYPE=0, TS=2, LSX=0, SLC=1,
SLCS=1;
ADD N7LNK: MN=23, LNKN=2, LNKNAME="To STP", LNKTYPE=0, TS=33, LSX=0, SLC=2,
SLCS=2;
```

```
ADD N7LNK: MN=23, LNKN=3, LNKNAME="To STP", LNKTYPE=0, TS=34, LSX=0, SLC=3,
SLCS=3;
```

Note:

- Because SoftX3000 provides MTP links to the STP, the "link type" parameter in the command must be set to "TDM 64K link".
- The "start circuit number" parameter in the command is set to the timeslot number of the EPII inside SoftX3000.
- MTP links cannot occupy the timeslot 0 (synchronization timeslot) of each E1. That is, the "start circuit number" parameter in the command cannot be 0, 32, 64, 96, 128, 160, 192, or 224.

//Add an MTP route to the SCP. The destination signaling point index is 50.

```
ADD N7RT: LSX=0, DPX=50, RTNAME="To SCP";
```

II. Configuring SCCP data

//Add an SCCP remote signaling point. The index of the SCCP remote signaling point is 0 and the destination signaling point code is 110a0a.

```
ADD SCCPDSP: DPX=0, NI=NN, DPC="110a0a", DPNAME="SCP", SHAREFLAG=NONE;
```

Note:

The "DSP index" parameter in this command is different from the "DSP index" defined in the **ADD N7DSP** command or the "destination entity index" defined in the **ADD M3DE** command. The three parameters have nothing to do with each other and there is no referencing or referenced relationship between them.

//Add SCCP subsystems

```
ADD  SCCPSSN:  SSNX=0,  NI=NN,  SSN=SCMG,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=1,  NI=NN,  SSN=INAP,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=2,  NI=NN,  SSN=SCMG,  SPC="110a0a",  OPC="001122",
SSNNAME="SSP to SCP";
ADD  SCCPSSN:  SSNX=3,  NI=NN,  SSN=INAP,  SPC="110a0a",  OPC="001122",
SSNNAME="SSP to SCP";
```

📕 **Note:**

- For Fixed Intelligent Network (FIN) services, two SSNs, **SCMG** and **INAP**, should be configured.
- The "SPC" parameter in the command is the destination signaling point code of the corresponding subsystem, that is, the receiver of local SCCP messages. For each subsystem, two destination signaling points must be defined: SCCP remote signaling point and local signaling point.

2.10.3 Commissioning Guideline

After completing the preceding configurations, conduct signaling interworking tests following the steps below.

I. Checking whether the state of the clock is normal

Before testing MTP links, make sure the clocks of SoftX3000 and the SCP keep synchronous. Otherwise, the MTP links cannot work normally. For more information, refer to Chapter 5, "Specialized Configurations", in this manual.

II. Checking whether the state of the MTP link is normal

Carry out the **DSP N7LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related MTP link is normal. If the state is abnormal, use the **LST N7LNK** command to check whether command parameters are configured correctly, such as module number, link type, start circuit number, signaling link code, and signaling link code send.

III. Checking whether the state of the MTP route is normal

Carry out the **DSP N7RT** command on the U-SYS SoftX3000 Client to check whether the state of the related MTP route is normal. If the state is abnormal, use **LST N7DSP**, **LST N7LKS**, and then **LST N7RT** to check whether the parameter referencing relationship among destination signaling point code, destination signaling point index, and linkset index is correct.

IV. Checking whether the state of the SCCP remote signaling point is normal

Carry out the **DSP SCCPDSP** command on the U-SYS SoftX3000 Client to check whether the state of the SCCP remote signaling point (that is, the signaling point code

of the SCP) is normal. If the state is abnormal, use **LST SCCPDSP** to check whether command parameters are configured correctly, such as DPC and OPC.

V. Checking whether the state of the SCCP subsystem is normal

Carry out the **DSP SCCPSSN** command on the U-SYS SoftX3000 Client to check whether the state of the related SCCP subsystem is normal. If the state is abnormal, use **LST SCCPSSN** to check whether command parameters are configured correctly, such as DPC, OPC, and SSN.

2.11 Configuring Data for Interconnecting with SCP (M3UA – MTP)

2.11.1 Introduction

I. Typical networking model

Before configuring Intelligent Network (IN) service data, make sure that the signaling data for interconnection between the SoftX3000 and Service Control Point (SCP) has been configured. Otherwise, IN services cannot be deployed. When INAP signaling at the SoftX3000 side is carried over M3UA links and INAP signaling at the SCP side is carried over MTP links, a typical networking model is illustrated in Figure 2-12.

Figure 2-12 Typical networking model for SoftX3000 interconnected with SCP (M3UA – MTP)

As shown in Figure 2-12, SoftX3000 provides M3UA links to an SG7000 and, through the SG7000, interworks INAP signaling with the SCP. To achieve the interconnection of

signaling between SoftX3000 and the SCP, configure the following interconnection data at SoftX3000 side.

- Signaling data for interconnection between SoftX3000 and the SG7000
- Signaling data for interconnection between SoftX3000 and the SCP

If the SCP in the actual networking application is provided by Huawei, the device that provides MTP links at the SCP side is the SAU (or USAU) of Huawei. Accordingly, the configuration of signaling interconnection data between SoftX3000 and the SCP is actually the configuration of signaling interconnection data between SoftX3000 and the SAU (or USAU).

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two M3UA links are provided between SoftX3000 and the SG7000. SS7 signaling traffic is shared between the links.
2) Signaling Connection Control Part (SCCP) connection can be set up between SoftX3000 and the SCP.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the SG7000 and SCP sides, as shown in Table 2-19 and Table 2-20.

Table 2-19 Interconnection parameters between SoftX3000 and SG7000

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of SG7000	211.169.150.70/255.255.0.0
3	Signaling point code of SoftX3000	001122 (national network)
4	Signaling point code of SG7000	001177 (national network)
5	Local SCTP port number for M3UA link at SoftX3000 side (client)	M3UA link 0: 2905 M3UA link 1: 2911
6	Local SCTP port number for M3UA link at SG7000 side (server)	2905
7	Routing context (SoftX3000 acts as an application server.)	333777

Table 2-20 Signaling interconnection parameters between SoftX3000 and SCP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of SCP	110c0c (national network)
3	Subsystem number between SoftX3000 and SCP	SCMG, INAP

2.11.2 Script

I. Configuring M3UA data

//Add an M3UA local entity. The index of the local entity is 0. The originating point code is 001122. The routing context is 333777.

```
ADD M3LE: LEX=0, LENAME="SoftX3000", OPC="001122", LET=AS, RC=333777;
```

 Note:

The routing context may be a decimal number or null (not configured). It should be negotiated with the SG7000.

//Add two M3UA destination entities. The destination signaling point index 10 represents the SG7000 connected to SoftX3000 in the associated signaling mode, and 30 represents the SCP.

```
ADD M3DE: DEX=10, DENAME="SG7000", DPC="001177", STPF=TRUE, DET=SG, ADJF=YES;
ADD M3DE: DEX=30, DENAME="SAU", DPC="110c0c", STPF=FALSE, DET=SP;
```

Note:

- Because SoftX3000 is networked with the SG7000 in a non-peer-to-peer mode and the entity type of SoftX3000 is Application Server (AS), the entity type of the SG7000 must be set to "SG".
- Because the interworking of SS7 signaling is achieved between SoftX3000 and the SCP through the SG7000, the destination entity type of the SCP must be set to "SP".
- Because the SG7000 has the signaling transfer function on the signaling network, the STP flag must be set to "TRUE". Otherwise, errors will be encountered when adding an M3UA route by using the **ADD M3RT** command.

//Add an M3UA linkset. The index of the linkset is 0. The index of the adjacent entity is 10.

```
ADD M3LKS: LSX=0, LSNAME="To SG7000", ADX=10, WM=ASP;
```

Note:

- Because there are M3UA signaling links in associated signaling mode between SoftX3000 and the SG7000, what is typed in the "adjacent entity index" parameter in the command should be the destination entity index of the SG7000. Here it is set to 10.
- Because SoftX3000 and the SG7000 are networked in a non-peer-to-peer mode and SoftX3000 acts as an AS, the "work mode" parameter in the command must be set to "ASP".

//Add two M3UA links. SoftX3000 is a client. The local SCTP port number of link 0 of module 136 is 2905 and that of link 0 of module 137 is 2911. The peer SCTP port number is the default value, 2905.

```
ADD M3LNK: MN=136, LNKN=0, LNKNAME="To SG7000 #0", LOCIP1="191.169.150.30",
LOCPORT=2905, PEERIP1="211.169.150.70", PEERPORT=2905, CS=C, LSX=0;
ADD M3LNK: MN=137, LNKN=0, LNKNAME="To SG7000 #1", LOCIP1="191.169.150.30",
LOCPORT=2911, PEERIP1="211.169.150.70", PEERPORT=2905, CS=C, LSX=0;
```

Note:

If two BSGIs are configured in SoftX3000, it is recommended to configure the two M3UA links in different BSGIs, so as to ensure the reliability of the M3UA links.

//Add an M3UA route to the SCP. The destination entity index is 30.

```
ADD M3RT: RTNAME="To SAU", DEX=30, LSX=0;
```

II. Configuring SCCP data

//Add an SCCP remote signaling point. The index of the SCCP remote signaling point is 1 and the destination signaling point code is 110c0c.

```
ADD SCCPDSP: DPX=1, NI=NN, DPC="110c0c", DPNAME="SCP", SHAREFLAG=NONE;
```

📖 Note:

The "DSP index" parameter in this command is different from the "DSP index" defined in the **ADD N7DSP** command or the "destination entity index" defined in the **ADD M3DE** command. The three parameters have nothing to do with each other and there is no referencing or referenced relationship between them.

//Add SCCP subsystems

```
ADD  SCCPSSN:  SSNX=0,  NI=NN,  SSN=SCMG,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=1,  NI=NN,  SSN=INAP,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=4,  NI=NN,  SSN=SCMG,  SPC="110c0c",  OPC="001122",
SSNNAME="SSP to SCP";
ADD  SCCPSSN:  SSNX=5,  NI=NN,  SSN=INAP,  SPC="110c0c",  OPC="001122",
SSNNAME="SSP to SCP";
```

📖 Note:

- For Fixed Intelligent Network (FIN) services, two SSNs, SCMG and INAP, should be configured.
- The "SPC" parameter in the command is the destination signaling point code of the corresponding subsystem, that is, the receiver of local SCCP messages. For each subsystem, two destination signaling points must be defined: SCCP remote signaling point and local signaling point.

2.11.3 Commissioning Guideline

After completing the preceding configurations, conduct signaling interworking tests following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the SG7000 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the state of the M3UA link is normal

Carry out the **DSP M3LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related M3UA link is normal. If the state is abnormal, use the **LST M3LNK** command to check whether command parameters are configured correctly, such as local port number, local IP address, peer port number, peer IP address, and C/S mode.

III. Checking whether the state of the M3UA route is normal

Carry out the **DSP M3RT** command on the U-SYS SoftX3000 Client to check whether the state of the related M3UA route is normal. If the state is abnormal, use **LST M3LE**, **LST M3DE**, and then **LST M3LKS** to check whether the parameter referencing relationship among local entity index, destination entity index, and linkset index is configured correctly.

IV. Checking whether the state of the SCCP remote signaling point is normal

Carry out the **DSP SCCPDSP** command on the U-SYS SoftX3000 Client to check whether the state of the SCCP remote signaling point (that is, the signaling point code of the SCP) is normal. If the state is abnormal, use **LST SCCPDSP** to check whether command parameters are configured correctly, such as DPC and OPC.

V. Checking whether the state of the SCCP subsystem is normal

Carry out the **DSP SCCPSSN** command on the U-SYS SoftX3000 Client to check whether the state of the related SCCP subsystem is normal. If the state is abnormal, use **LST SCCPSSN** to check whether command parameters are configured correctly, such as DPC, OPC, and SSN.

2.12 Configuring Data for Interconnecting with SCP (M3UA – M3UA)

2.12.1 Introduction

I. Typical networking model

Before configuring IN service data, make sure that the signaling data for interconnection between the SoftX3000 and the SCP has been configured. Otherwise, IN services cannot be deployed. When INAP signaling at the SoftX3000 side and at the SCP side is both carried over M3UA links, a typical networking model is illustrated in Figure 2-13.

Figure 2-13 Typical networking model for SoftX3000 interconnected with SCP (M3UA – M3UA)

As shown in Figure 2-13, SoftX3000 provides M3UA links to interwork INAP signaling with the SCP through an IP packet network. To achieve the interconnection of signaling between SoftX3000 and the SCP, configure the following interconnection data at SoftX3000 side.

If the SCP in the actual networking application is provided by Huawei, the device that provides M3UA links at the SCP side is the USAU of Huawei. Accordingly, the configuration of signaling interconnection data between SoftX3000 and the SCP is actually the configuration of signaling interconnection data between SoftX3000 and the USAU.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two M3UA links are provided between SoftX3000 and the SCP. SS7 signaling traffic is shared between the links.

2) Signaling Connection Control Part (SCCP) connection can be set up between SoftX3000 and the SCP.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the SCP side, as shown in Table 2-21.

Table 2-21 Signaling interconnection parameters between SoftX3000 and SCP

Serial No.	Parameter	Value
1	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of SCP	211.169.150.35/255.255.0.0
3	Signaling point code of SoftX3000	001122 (national network)
4	Signaling point code of SCP	110e0e (national network)
5	Local SCTP port number for M3UA link at SoftX3000 side (client)	M3UA link 2: 2905 M3UA link 3: 2911
6	Local SCTP port number for M3UA link at SCP side (server)	2905
7	Subsystem number between SoftX3000 and SCP	SCMG, INAP

2.12.2 Script

I. Configuring M3UA data

//Add an M3UA local entity. The index of the local entity is 0. The originating point code is 001122. The routing context is 333777.

```
ADD M3LE: LEX=0, LENAME="SoftX3000", OPC="001122", LET=AS, RC=333777;
```

 Note:

The routing context may be a decimal number or null (not configured). It should be negotiated with the SCP.

//Add an M3UA destination entity. The destination signaling point index 50 represents the SCP.

```
ADD M3DE: DEX=50, DENAME="USAU", DPC="110e0e", STPF=FALSE, DET=AS;
```

 Note:

Because SoftX3000 is networked with the SCP in a peer-to-peer mode and the entity type of SoftX3000 is Application Server (AS), the destination entity type of the SCP must be set to "AS".

//Add an M3UA linkset. The index of the linkset is 1. The index of the adjacent entity is 50.

```
ADD M3LKS: LSX=1, LSNAME="To USAU", ADX=50, TM=LOADSHARE, WM=IPSP;
```

 Note:

- Because there are M3UA signaling links in associated signaling mode between SoftX3000 and the SCP, what is typed in the "adjacent entity index" parameter in the command should the destination entity index of the SCP. Here it is set to 50.
- Because SoftX3000 and the SCP are networked in a peer-to-peer mode and SoftX3000 acts as an AS, the "work mode" parameter in the command must be set to "IPSP".
- The traffic mode of the linkset must be the same as that of the SG; otherwise, all M3UA links of the linkset cannot work normally. Unless otherwise specified, the traffic mode of the linkset should be set to "Load-share".

//Add two M3UA links. SoftX3000 is a client. The local SCTP port number of link 1 of module 136 is 2905 and that of link 1 of module 137 is 2911. The peer SCTP port number is the default value, 2905.

```
ADD M3LNK: MN=136, LNKN=1, LNKNAME="To SCP #0", LOCIP1="191.169.150.30",
LOCPORT=2905, PEERIP1="191211.169.150.1235", PEERPORT=2905, CS=C, LSX=0;
ADD M3LNK: MN=137, LNKN=1, LNKNAME="To SCP #1", LOCIP1="191.169.150.30",
LOCPORT=2911, PEERIP1="191211.169.150.1235", PEERPORT=2905, CS=C, LSX=0;
```

📕 **Note:**

If two BSGIs are configured in SoftX3000, it is recommended to configure the two M3UA links in different BSGIs, so as to ensure the reliability of the M3UA links.

//Add an M3UA route to the SCP. The destination entity index is 50.

```
ADD M3RT: RTNAME="To USAU", DEX=50, LSX=0;
```

II. Configuring SCCP data

//Add an SCCP remote signaling point. The index of the SCCP remote signaling point is 2 and the destination signaling point code is 110e0e.

```
ADD SCCPDSP: DPX=2, NI=NN, DPC="110e0e", DPNAME="SCP", SHAREFLAG=NONE;
```

📕 **Note:**

The "DSP index" parameter in this command is different from the "DSP index" defined in the **ADD N7DSP** command or the "destination entity index" defined in the **ADD M3DE** command. The three parameters have nothing to do with each other and there is no referencing or referenced relationship between them.

//Add SCCP subsystems

```
ADD  SCCPSSN:  SSNX=0,  NI=NN,  SSN=SCMG,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=1,  NI=NN,  SSN=INAP,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=6,  NI=NN,  SSN=SCMG,  SPC="110e0e",  OPC="001122",
SSNNAME="SSP to SCP";
ADD  SCCPSSN:  SSNX=7,  NI=NN,  SSN=INAP,  SPC="110e0e",  OPC="001122",
SSNNAME="SSP to SCP";
```

 Note:

- For Fixed Intelligent Network (FIN) services, two SSNs, SCMG and INAP, should be configured.
- The "SPC" parameter in the command is the destination signaling point code of the corresponding subsystem, that is, the receiver of local SCCP messages. For each subsystem, two destination signaling points must be defined: SCCP remote signaling point and local signaling point.

2.12.3 Commissioning Guideline

After completing the preceding configurations, conduct signaling interworking tests following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the SCP (that is, the USAU) is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the state of the M3UA link is normal

Carry out the **DSP M3LNK** command on the U-SYS SoftX3000 Client to check whether the state of the related M3UA link is normal. If the state is abnormal, use the **LST M3LNK** command to check whether command parameters are configured correctly, such as local port number, local IP address, peer port number, peer IP address, and C/S mode.

III. Checking whether the state of the M3UA route is normal

Carry out the **DSP M3RT** command on the U-SYS SoftX3000 Client to check whether the state of the related M3UA route is normal. If the state is abnormal, use **LST M3LE**, **LST M3DE**, and then **LST M3LKS** to check whether the parameter referencing relationship among local entity index, destination entity index, and linkset index is configured correctly.

IV. Checking whether the state of the SCCP remote signaling point is normal

Carry out the **DSP SCCPDSP** command on the U-SYS SoftX3000 Client to check whether the state of the SCCP remote signaling point (that is, the signaling point code

of the SCP) is normal. If the state is abnormal, use **LST SCCPDSP** to check whether command parameters are configured correctly, such as DPC and OPC.

V. Checking whether the state of the SCCP subsystem is normal

Carry out the **DSP SCCPSSN** command on the U-SYS SoftX3000 Client to check whether the state of the related SCCP subsystem is normal. If the state is abnormal, use **LST SCCPSSN** to check whether command parameters are configured correctly, such as DPC, OPC, and SSN.

2.13 Configuring Data for Interconnecting with SCP/SMCP (INAP over IP)

2.13.1 Introduction

I. Typical networking model

Before configuring IN service data, make sure that the signaling data for interconnection between the SoftX3000 and the SCP has been configured. Otherwise, IN services cannot be deployed. When INAP signaling at the SoftX3000 side and at the SCP/Service Management Control Point (SMCP) side is both carried over IP links, a typical networking model is illustrated in Figure 2-14.

Figure 2-14 Typical networking model for SoftX3000 interconnected with SCP/SMCP (INAP over IP)

As shown in Figure 2-14, SoftX3000 interconnects with SCP/SMCP through an IP interface (that is, physical FE port) provided by the HSCI in a frame instead of the IFMI. In actual networking, internal Ethernet cables of the HSCI of each frame are connected to 0#LAN Switch and 1#LAN Switch of the integrated configuration cabinet, so the IP interface for SoftX3000 to interconnect with SCP/SMCP is led out through the Ethernet cables from 0#LAN Switch and 1#LAN Switch of the integrated configuration cabinet.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two INAP over IP TCP links are provided between SoftX3000 and the SCP/SMCP.
2) TCP connection can be set up between SoftX3000 and SCP/SMCP.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure that the following interconnection parameters as shown in Table 2-22 have been negotiated with the SCP/SMCP side.

Table 2-22 Signaling interconnection parameters between SoftX3000 and SCP/SMCP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of SCP/SMCP	110f0f (national network)
3	IP address of virtual FE port of FCCU No. 22	10.72.32.22/255.255.255.0
4	IP address of virtual FE port of FCCU No. 23	10.72.32.23/255.255.255.0
5	IP address of SCP/SMCP	10.72.32.16/255.255.255.0
6	Local TCP port number for TCP link at SoftX3000 side (client)	TCP link 22: 7780 TCP link 23: 7781
7	Local TCP port number for TCP link at SCP/SMCP side (server)	7779
8	Range of module dialog numbers	Module 22: 0–1999 Module 23: 2000–3999

2.13.2 Script

I. Configuring MTP data

//Add an MTP DSP. The index of the DSP is 60. The SPC of SCP/SMCP is 110f0f.

```
ADD N7DSP: DPX=60, DPC="110f0f", DPNAME="SCP_SMCP", STPF=FALSE, ADJF=TRUE;
```

📖 **Note:**

For an SCP whose DSP is indexed 60, set "STP flag" to "FALSE" and "adjacent flag" to "TRUE" in the command.

II. Configuring SSAP data

//Modify P78 (Carry out this operation only when SoftX3000 interconnects with SCP.)

```
MOD FSFP: ID=P78, VAL="FBFF";
```

📖 **Note:**

If INAP over IP is applied in networking, it is regarded that SMCP connects with SoftX3000 directly by default. If SCP connects with SoftX3000 directly, you need to modify bit 10 of SSP internal parameter 2 (P78) to 0 to keep consistent with the software setting at the SCP side; otherwise, IN services cannot be used.

//Add INAP over IP configuration.

```
ADD  INAPOIP:  MN=22,  MEM0="10.72.32.22",  SCP0="10.72.32.16",  RP=7779,
DG="10.72.32.1", MASK="255.255.255.0";
ADD  INAPOIP:  MN=23,  MEM0="10.72.32.23",  SCP0="10.72.32.16",  RP=7779,
DG="10.72.32.1", MASK="255.255.255.0";
```

📖 **Note:**

- For different FCCUs/FCSUs, local IP address 0 must be different.
- To ensure the reliability of the internal Ethernet communication system of SoftX3000, the local IP address cannot be within 172.20.XXX.XXX or 172.30.XXX.XXX.
- Because SCP/SMCP works in Server mode on TCP links, the TCP link of each FCCU/FCSU of SoftX3000 can use the same remote port number, for example, 7779.

//Add module dialog number data. FCCU 22 can use dialog numbers ranging from 0 t 1999. FCCU 23 can use dialog numbers ranging from 2000 to 3999.

```
ADD DLGNUM: MN=22, SN=0;
```

```
ADD DLGNUM: MN=23, SN=2000;
```

📖 **Note:**

- Dialog number is a kind of resource. Currently, there are 6000 dialog numbers (numbered from 0 to 5999) available between SoftX3000 and an SMCP.

- By default, after a start dialog number is set for an FCCU/FCSU, SoftX3000 defines an end dialog number for the FCCU/FCSU automatically, that is, end dialog number = start dialog number + 1999.

- Dialog numbers used by all FCCUs/FCSUs cannot be the same; otherwise, call loss might occur.

2.13.3 Commissioning Guideline

After completing the preceding configurations, conduct signaling interworking tests following the steps below.

I. Checking whether the network connection is normal

1) Use an Ethernet cable to connect the Ethernet port of a test PC with that of 0#LAN Switch of the integrated configuration cabinet. Set the IP address of the test PC to make it in the same network segment as the IP address of the virtual FE port of the FCCU.

2) Use the ping utility on the test PC to check the IP address of the virtual FE port of each FCCU and that of SCP/SMCP. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

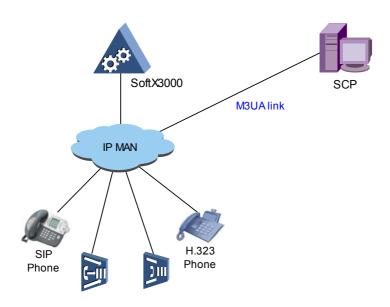#### II. Checking whether the state of the INAP over IP TCP link is normal

Carry out the **DSP INAPOIP** command on the U-SYS SoftX3000 Client to check whether the state of the related TCP link is normal. If the state is abnormal, use the **LST INAPOIP** command to check whether command parameters are configured correctly, such as local IP address, peer port number, and peer IP address.
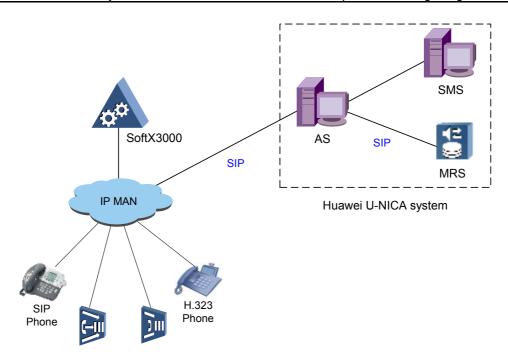
Confirm if SMCP or SCP connects with SoftX3000 directly. If it is SCP, use **MOD FSFP** to modify bit 10 of SSP internal parameter 2 (P78) to 0.

2.14 Configuring Data for Interconnecting with AS (through SIP)

2.14.1 Introduction

I. Typical networking model

When SoftX3000 networks with Application Server (AS) in NGN and enables such value-added services as SIP-PPS, ONLY, and RBT, SIP is used as the control signaling, and the typical networking is as shown in Figure 2-15.

Figure 2-15 Typical networking model for SoftX3000 interconnected with AS (through SIP)

II. Implementation requirements

It is required that SIP connection can be set up between SoftX3000 and AS through data configuration at SoftX3000 side.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure that the following interconnection parameters as shown in Table 2-23 have been negotiated with the AS side.

Table 2-23 Signaling interconnection parameters between SoftX3000 and AS

Serial No.	Parameter	Value
1	Signaling between SoftX3000 and AS	SIP
2	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
3	IP address of AS	211.169.150.38/255.255.0.0
4	Well-known port number of SIP at SoftX3000 side	5060
5	Well-known port number of SIP at peer SoftX3000 side	5060

2.14.2 Script

SIP data is public data. If SIP data has been set in other situations, no setting is necessary here.

I. Configuring SIP data

//Set global configuration information of SIP.

```
SET SIPCFG:;
```

//Set local port number of SIP.

```
SET SIPLP: MN=211, PORT=5061;
```

📔 **Note:**

The peer softswitch sends the first SIP message containing the well-known port number 5050 to the local SoftX3000. Upon receiving the SIP message, the IFMI sends it in load sharing mode to the MSGI. Then the IFMI of the SoftX3000 sends the SIP message containing the local port number 5061 of the MGSI. The peer softswitch receives the returned SIP message and sends a subsequent one, which contains the local port number 5061 of the MSGI in the first SIP message. After receiving the message, the IFMI of the SoftX3000 sends it directly to the MSGI whose local port number is 5061 for further processing.

II. Configuring routing data

//Add an office direction to AS. The office direction number is 80.

```
ADD OFC: O=80, ON="APP Server", DOT=CC, DOL=LOW, METHOD=NOCONV;
```

📔 **Note:**

- Because this office direction does not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.
- Office name must be specified depending on operators' requirements. Do not use the default name given by the system.

//Add a sub-route numbered 80.

```
ADD SRT: SRC=80, O=80, SRN="To APP Server", TSM=CYC;
```

//Add a route numbered 80.

```
ADD RT: R=80, RN="To APP Server", SR1=80;
```

//Add analysis data for the route to AS. The route selection code is 80.

```
ADD RTANA: RSC=80, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=80,
ISUP=SIP_M;
```

 Note:

- Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".
- Because the signaling interconnection between the local office and the opposite office uses the SIP protocol, it is necessary to set the "signaling as prior" parameter in the command to "SIP select must".

III. Configuring SIP trunk data

//Add an SIP trunk group numbered 80.

```
ADD SIPTG: TG=80, SRT=80, TGN="To APP Server", RCHS=88, OTCS=99, IMN=132,
OSU="211.169.150.38:5060", UHB=NO, VEDIOS=SUPPORT;
```

 Note:

- The "Remote URI" parameter in the command is set in the format of "*Opposite IP address*:*SIP port number*". Here it is set to "211.169.150.38:5060".
- The parameter "use heart beat" should be set correctly. If the peer AS cannot identify heartbeat signals, this parameter must be set to "No"; otherwise, the SIP trunk will be faulty all the time.

IV. Configuring number analysis data

//Add number analysis data. The route selection code is 80. The access code for the SIP-PPS service is 205. The access code for the ONLY service is 500.

```
ADD CNACLD: PFX=K'205, CSA=LC, RSC=80, MINL=3, MAXL=3, CHSC=0;
ADD CNACLD: PFX=K'500, CSA=LC, RSC=80, MINL=3, MAXL=24, CHSC=0;
```

📖 **Note:**

Different from normal IN services, such NGN value-added services as SIP-PPS and
ONLY are triggered by AS that controls their service logics. You only need to enter the
corresponding access code at SoftX3000 side and route the service to the
corresponding SIP trunk.

2.14.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps
below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network
connection between SoftX3000 and the SoftSwitch office B is normal. If the connection
is normal, proceed with the subsequent steps. If the connection is abnormal, check
whether network cables are well connected and whether the IP routing data is
configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Testing service by making a call

If the network connection is normal, originate a call from the office A to the office B. If
the call is made successfully, it indicates that the data is configured correctly. Otherwise,
do the following:

1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and **LST SIPTG** to check
    whether the parameter referencing relationship among route selection code, route
    number, sub-route number, and trunk group number is configured correctly.
2) Use **LST SIPTG** to check whether the "Remote URI" parameter is configured
    correctly.
3) Check whether data is configured correctly at the opposite side if no data
    configuration errors are found at SoftX3000 side.

2.15 Configuring Data for Interconnecting with PBX (through PRA Trunk)

2.15.1 Introduction

I. Typical networking model

When SoftX3000 is interconnected with Private Branch Exchange (PBX) or Network Access Server (NAS) in PSTN, Digital Subscriber Signaling No. 1 (DSS1) can be used as the inter-office signaling. For PBX, DSS1 signaling is carried only over Primary Rate Adaptation (PRA) link; for SoftX3000, DSS1 signaling is carried usually over ISDN Q.921-User Adaptation Layer (IUA) link. In this case, a typical networking model is illustrated in Figure 2-16.

Figure 2-16 Typical networking model for SoftX3000 interconnected with PBX (through PRA trunk)

As shown in Figure 2-16, SoftX3000 provides IUA links to a UMG8900, and through the UMG8900 (with embedded signaling gateway functionality) SoftX3000 interworks DSS1 signaling with the PBX. For voice channels, SoftX3000 interworks with the PBX by controlling the UMG8900. To achieve the interworking between SoftX3000 and the PBX, configure the following interconnection data at SoftX3000 side.

- Interconnection data between SoftX3000 and the UMG8900 (with embedded signaling gateway functionality)
- Interconnection data between SoftX3000 and the PBX

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two E1 circuits are provided between SoftX3000 and the PBX through the UMG8900.
2) Two IUA links are provided between SoftX3000 and the UMG8900. DSS1 signaling traffic is shared between the links.
3) Subscribers in the local office and subscribers in the PBX can call each other.
4) A subscriber number, 2250000, is charged for all calls made by PBX subscribers through PRA incoming trunk.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the UMG8900 and PBX sides, as shown in Table 2-24 and Table 2-25.

Table 2-24 Interconnection parameters between SoftX3000 and UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248
2	H.248 code type	ASN.1 (binary format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of UMG8900 for H.248	211.169.150.45/255.255.0.0
5	IP address of UMG8900 for SIGTRAN	211.169.150.46/255.255.0.0
6	Local UDP port number of H.248 at SoftX3000 side	2944
7	Local UDP port number of H.248 at UMG8900 side	2944
8	Speech codecs supported by UMG8900	G.711A, G.711③, G.723.1, G.729A
9	Whether UMG8900 supports hairpin connection	Supported
10	Whether UMG8900 supports EC function	Supported
11	Whether UMG8900 supports T.38 protocol	Supported
12	Numbering plan for E1s at UMG8900	Starting from 0
13	Numbering plan for termination IDs (E1 timeslots) at UMG8900	Starting from 0

Serial No.	Parameter	Value
14	E1 numbers in PRA trunk group at SoftX3000 side	6 ~ 7
15	Corresponding E1 identifiers in PRA trunk group at UMG8900 side	0 ~ 1
16	Local Stream Control Transmission Protocol (SCTP) port number for IUA link at SoftX3000 side (client)	IUA link 0: 9900 IUA link 1: 9901
17	Local SCTP port number for IUA link at UMG8900 side (server)	9900
18	Traffic mode on IUA link between SoftX3000 and UMG8900	Load share
19	Interface ID (integer) of PRA link 0	12345
20	Interface ID (integer) of PRA link 1	54321

Table 2-25 Interconnection parameters between SoftX3000 and PBX

Serial No.	Parameter	Value
1	DSS1 signaling type at SoftX3000 side (the UMG8900 side must be consistent with the SoftX3000 side)	Network side
2	DSS1 signaling type at PBX side	Subscriber side
3	PRA link circuit number (at SoftX3000 side)	Link 0: 208 Link 1: 240
4	Termination ID of PRA link circuit number (at UMG8900 side)	Link 0: 16 Link 1: 48
5	Selection type for PRA trunk circuits	Cyclic selection
6	Number segment for PBX subscribers	2225000 ~ 2225999
7	Charged number for PBX	2225000

2.15.2 Script

I. Configuring MG data

//Add a UMG8900 with equipment ID as 211.169.150.45:2944.

```
ADD MGW: EID="211.169.150.45:2944", GWTP=UMGW, MGWDESC="ShenZhen-UMG8900-05",
MGCMODULENO=23,   LA="191.169.150.30",   RA1="211.169.150.45",   RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

📕 **Note:**

- For UMG8900, no matter whether it serves as AG or TG, the format of the parameter "equipment ID" in this command must be "IP address: Port number", and "gateway type" must be "UMGW".
- The "remote address" parameter in the command must be set to the IP address of the UMG8900 used for the H.248 protocol, that is, 211.169.150.45.
- Because the H.248 protocol of UMG8900 only supports binary mode, the "code type" parameter in the command must be set to "ASN.1".
- Because the UMG8900 in this example supports hairpin connection function, the "hairpin connection" parameter in this command must be set to "supported". If a UMG8900 does not support hairpin connection function, the parameter is set to "not supported"; otherwise, the call cannot be connected normally.

II. Configuring IUA data

//Add an embedded signaling gateway (built in the UMG8900) with the ID 3.

```
ADD ESG: SGID=3, SGNAME="IUA SG", EID="211.169.150.45:2944";
```

📕 **Note:**

Because the signaling gateway is embedded in the UMG8900, what is typed in the "equipment ID" parameter in the command must be the equipment ID of the UMG8900. Here it is set to "211.169.150.45:2944".

//Add an IUA linkset. The index of the linkset is 2. The equipment type is PRA. Integer interface ID is used.

```
ADD IUALKS: LSX=2, LSNAME="IUA LinkSet 2", TM=LOADSHARE, DT=PRA, IFT=INTEGER,
SGID=3;
```

📖 **Note:**

- Unless otherwise specified, the traffic mode of the linkset should be set to "Load-share".
- The traffic mode of the linkset must be the same as that of the SG; otherwise, all IUA links of the linkset cannot work normally.

//Add two IUA links. SoftX3000 is a client. The local SCTP port number of link 2 of module 136 is 9900 and that of link 2 of module 137 is 9901. The peer SCTP port number is the default value, 9900.

```
ADD IUALNK: MN=136, LNKN=2, LSX=2, LOCPORT=9900, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.46";
ADD IUALNK: MN=137, LNKN=2, LSX=2, LOCPORT=9901, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.46";
```

📖 **Note:**

- The "peer IP address" parameter in the command must be set to the IP address of the UMG8900 used for the SIGTRAN protocol, that is, 211.169.150.46.
- If two BSGIs are configured in SoftX3000, it is recommended to configure the two IUA links in different BSGIs, so as to ensure the reliability of the IUA links.

III. Configuring PRA link data

//Add two PRA links. For link 0, its circuit number is 208, interface ID is 12345, signaling type is DSS1 network side, and caller number check mode is "use default number". For link 1, its circuit number is 240, interface ID is 54321, signaling type is DSS1 network side, and caller number check mode is "use default number".

```
ADD  PRALNK: PLN=0,  SCN=208,  MN=23,  LKS=2,  BINIFID=12345,  SIGT=NET,
NCF=DEFAULT_CLI;
ADD  PRALNK: PLN=1,  SCN=240,  MN=23,  LKS=2,  BINIFID=54321,  SIGT=NET,
NCF=DEFAULT_CLI;
```

 Note:

- The signal circuit number of the PRA link is a logical circuit number assigned inside SoftX3000. Its specific value is calculated on the basis of the "start circuit" number defined in the **ADD PRATKC** command. Because a PRA link can only occupy the timeslot 16 of an E1, the corresponding calculation formula is: *signal circuit number of PRA link* **=** *start circuit number of the corresponding PRA trunk group* + 16.
- The interface ID of a PRA link borne over IUA must be defined. The corresponding (integer) interface IDs of different PRA links cannot be the same.
- Regard SoftX3000 and TMG as a unit. Set the same signaling type—"DSS1 network side" or "DSS1 subscriber side" for SoftX3000 and the TMG. In this example, the PRA signaling type of SoftX3000 and UMG8900 are both set to "DSS1 network side". Therefore, the signaling type of the PBX side must be set to "DSS1 subscriber side"; otherwise, the PRA link cannot be established.
- The calls made by PBX subscribers through PRA incoming trunks are all charged on the subscriber number 2250000, so the parameter "caller number check mode" must be set to "use default number".

IV. Configuring routing data

//Add an office direction numbered 91 to the PBX.

```
ADD OFC: O=91, ON="H_office", DOT=PBX, DOL=LOW, METHOD=NOCONV;
```

 Note:

- Because the opposite office is a PBX, to avoid alternative routing between the offices of the same level, the level of the opposite office should be set to be lower than the local office.
- Because this office direction does not have No. 7 trunk circuits, the "DPC" parameter in the command is unnecessarily set.

//Add a sub-route numbered 91.

```
ADD SRT: SRC=91, O=91, SRN="To H_office", TSM=CYC;
```

//Add a route numbered 91.

```
ADD RT: R=91, RN="To H_office", SR1=91;
```

//Add route analysis data to the PBX. The route selection code is 91.

```
ADD RTANA: RSC=91, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=91,
ISUP=NOCHG;
```

📖 **Note:**

Usually, unless otherwise specified, set the caller category (RUT), address information indication (ADI), caller access (CLR), and transmission capability (TP) all to "all".

V. Configuring PRA subscriber data

//Add ISDN data. The ISDN index is set to 2. The maximum number of B channels is set to 30.

```
ADD ISDNDAT: ISDNX=2, BCHN=30;;
```

📖 **Note:**

For PRA subscribers, the parameter "Maximum B channel" must be set to 30.

//Add a PRA subscriber with route selection code as 91 and ISDN index as 2.

```
ADD PRA: D=K'2225000, P=0, RTSL=91, ISDNX=2, MN=23, CSC=0, RCHS=22,
NS=DDI-1&CLIP-1;
```

📖 **Note:**

- Because SoftX3000 controls a PRA trunk group by means of the attributes of the PRA subscriber such as call-in right, call-out right, charge, and route selection, the PRA subscriber data must be correctly configured to guarantee the successful interworking of PRA trunk. In addition, the following should be noted:
- The PRA subscriber number must be defined correctly. This number is considered as the default calling number to be referenced in the **ADD PRATG** command.
- The call-in rights defined for the PRA subscriber are used to control the outgoing call permissions of the PRA trunk group, and the call-out rights used to control the incoming call permissions of the PRA trunk group.
- If the called number received from the opposite office is a "subscriber number", not a "national significant number", the PRA subscriber should be defined with the "Direct Dialing In" (DDI) authority.
- If the opposite office requires the local office to send the calling number, the PRA subscriber has to be defined with the "Calling Line Identification Presentation" (CLIP) authority.

VI. Configuring PRA trunk data

//Add two PRA trunk groups. The parameter "Caller number provision mode" of both trunk groups is "Trunk line ID". The trunk group 91 uses the PRA link 0 and the default calling number is 2225000. The trunk group 92 uses the PRA link 1 and the default calling number is 2225000.

```
ADD PRATG: TG=91, MGW="211.169.150.45:2944", SRC=91, LINK=0, CDEF=K'2225000,
TGN="To H_office", IPM=TRK;
ADD PRATG: TG=92, MGW="211.169.150.45:2944", SRC=91, LINK=1, CDEF=K'2225000,
TGN="To H_office", IPM=TRK;
```

  📖 **Note:**

- The "default calling number" parameter in the command must be set to the PRA subscriber number defined in the **ADD PRA** command. Otherwise, PRA trunk cannot interwork successfully.
- Because SoftX3000 controls a PRA trunk group by means of the attributes of the PRA subscriber such as call-in right, call-out right, charge, and route selection, the "charging source code", "outgoing trunk charging source", "incoming call authority", and "outgoing call authority" parameters in the command are unnecessarily set.
- When the PBX accesses SoftX3000 through PRA trunk and occupies subscriber number resources of the local office, you can set "Caller number provision mode" of the corresponding PRA outgoing trunk to "Trunk line ID", so as to prevent the PBX from using unauthorized PSTN numbers and facilitate controlling number allocation of the PBX.

//Add PRA trunk circuits.

```
ADD PRATKC: MN=23, TG=91, SC=192, EC=223, TID=0;
ADD PRATKC: MN=23, TG=92, SC=224, EC=255, TID=32;
```

  📖 **Note:**

- What is typed in the "start circuit" and "end circuit" parameters in the command is a logical number universally assigned among No. 7, PRA, R2, and V5 E1 trunk circuits in an FCCU/FCSU module inside SoftX3000. The corresponding physical number at the UMG8900 side is specified in the "start circuit termination ID" parameter.
- The absolute value of the difference between start circuit number and start circuit termination ID must be an integral multiple of 32, such as 0, 32, 64, and 96.

VII. Configuring number analysis data

//Add a call prefix 2225.

```
ADD CNACLD: PFX=K'2225, CSA=LC, RSC=91, MINL=4, MAXL=7, CHSC=0;
```

📖 **Note:**

- Because 2225 is a call prefix for outgoing calls through the PRA trunk group, the "route selection code" parameter in the command must be the same as that used by the default calling number 2225000 of this PRA trunk group (it is 91 in the example); otherwise, routing will fail.
- Because destination code charging is used for the prefix 2225, the "charging selection code" parameter in the command is set to 0, not 65535.

2.15.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the UMG8900 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the UMG8900 has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the UMG8900 has been registered normally, and then decide the next steps according to the returned result.

1) If "normal" is returned, it indicates that the UMG8900 has been registered and its data configuration is correct.
2) If "disconnect" is displayed, it indicates that the UMG8900 has been registered but is out of service now. In this case, check whether the related data at either side has been modified.
3) If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether the state of the IUA link is normal

Carry out the **DSP IUALNK** command on the U-SYS SoftX3000 Client to check whether the state of the related IUA link is normal. If the state is abnormal, use the command **LST IUALKS** to check whether the traffic mode the linkset is set correctly,

and then use the **LST IUALNK** command to check whether command parameters are configured correctly, such as local port number, local IP address, peer port number, and peer IP address.

IV. Checking whether the state of the PRA link is normal

Carry out the **DSP PRALNK** command on the U-SYS SoftX3000 Client to check whether the state of the related PRA link is normal. If the state is abnormal, use the **LST PRALNK** command to check whether command parameters are configured correctly, such as module number, IUA linkset index, signal circuit number, interface ID, and signaling type.

V. Checking whether the state of the PRA trunk circuit is normal

Carry out the **DSP N1C** command on the U-SYS SoftX3000 Client to check whether the state of the related PRA trunk circuit is normal. If the state is abnormal, use **LST TG** and then **LST TKC** to check whether command parameters are configured correctly, such as equipment ID, start circuit number, and start circuit termination ID.

VI. Testing service by making a call

If the preceding check indicates normality and correctness, originate a call from the SoftSwitch to the PBX. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:

1) Use **LST PRA** to check whether the PRA subscriber is configured with correct attributes such as call-in right, call-out right, DDI authority, and CLIP authority.
2) Use **LST RTANA**, **LST RT**, **LST SRT**, and then **LST TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.
3) Check whether data is configured correctly at the PBX side if no data configuration errors are found at SoftX3000 side.

2.16 Configuring Data for Interconnecting with PBX (through R2 Trunk)

2.16.1 Introduction

I. Typical networking model

When SoftX3000 is interconnected with PBX or NAS in PSTN, R2 can also be used as the inter-office signaling. See the following networking model for SoftX3000 interconnected with PBX in R2 through Huawei-developed UMG8900 (or TMG8010).

Figure 2-17 Typical networking model for SoftX3000 interconnected with PBX (through R2 trunk)

Because R2 signaling is channel associated signaling, the trunk media gateway UMG8900 shown in Figure 2-17 supports the R2 signaling conversion function, that is, SoftX3000 interworks with PBX in R2 through UMG8900, but SoftX3000 controls UMG8900 to provide channels for interconnection with PBX. To achieve the interworking between SoftX3000 and the PBX, configure the following interconnection data at SoftX3000 side.

- Interconnection data between SoftX3000 and the UMG8900.
- Interconnection data between SoftX3000 and the PBX.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Two E1 circuits are provided between SoftX3000 and the PBX through the UMG8900.

2) Subscribers in the local office and subscribers in the PBX can call each other.

3) Destination code charging is adopted in the local office for incoming calls from the PBX subscribers.

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the UMG8900 and PBX sides, as shown in Table 2-26 and Table 2-27.

Table 2-26 Interconnection parameters between SoftX3000 and UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248
2	H.248 code type	ASN.1 (binary format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of UMG8900 for H.248	211.169.150.47/255.255.0.0
5	Local UDP port number of H.248 at SoftX3000 side	2944
6	Local UDP port number of H.248 at UMG8900 side	2944
7	Speech codecs supported by UMG8900	G.711A, G.711③, G.723.1, G.729A
8	Whether UMG8900 supports hairpin connection	Supported
9	Whether UMG8900 supports EC function	Supported
10	Whether UMG8900 supports T.38 protocol	Supported
11	Numbering plan for E1s at UMG8900	Starting from 0
12	Numbering plan for termination IDs (E1 timeslots) at UMG8900	Starting from 0
13	E1 numbers in R2 trunk group at SoftX3000 side	8~9
14	Corresponding E1 identifiers in R2 trunk group at UMG8900 side	0~1

Table 2-27 Interconnection parameters between SoftX3000 and PBX

Serial No.	Parameter	Value
1	Channel associated signaling	R2
2	R2 trunk circuit selection mode	Cyclic selection
3	Number segment of PBX subscribers	3630000~3630999

2.16.2 Script

I. Configuring MG data

//Add a UMG8900 with equipment ID as 211.169.150.47:2944.

```
ADD MGW: EID="211.169.150.47:2944", GWTP=UMGW, MGWDESC="ShenZhen-UMG8900-06",

MGCMODULENO=23,    LA="191.169.150.30",    RA1="211.169.150.47",    RP=2944,

LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

 Note:

- For UMG8900, no matter whether it serves as AG or TG, the format of the parameter "equipment ID" in this command must be "IP address: Port number", and "gateway type" must be "UMGW".
- Because the H.248 protocol of UMG8900 only supports binary mode, the "code type" parameter in the command must be set to "ASN.1".
- Because the UMG8900 in this example supports hairpin connection function, the "hairpin connection" parameter in this command must be set to "supported". If a UMG8900 does not support hairpin connection function, the parameter is set to "not supported"; otherwise, the call cannot be connected normally.

II. Configuring routing data

//Add an office direction to the PBX. The office direction number is set to 93.

```
ADD OFC: O=93, ON="K_office", DOT=PBX, DOL=LOW, METHOD=NOCONV;
```

 Note:

- According to the principle of no alternative route between peer offices, because the opposite office is the PBX, the parameter "peer office level" should be set to "inferior".
- No. 7 trunk circuits are not contained in this office, so the parameter "DPC" need not be set.

//Add a sub-route numbered 93.

```
ADD SRT: SRC=93, O=93, SRN="To K_office", TSM=CYC;
```

//Add a route numbered 93.

```
ADD RT: R=93, RN="To K_office", SR1=93;
```

//Add analysis data for the route to the PBX. The route selection code is set to 93.

```
ADD RTANA: RSC=93, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL,-TP=ALL, TMX=0, R=93,
ISUP=NOCHG;
```

III. Configuring R2 trunk data

//Add CAS signaling configuration. The CAS signaling name is R2. The signaling type is R2.

```
ADD CASCFG: SN="R2", SAT=R2;
```

//Add R2 trunk groups: trunk group 93 is an outgoing trunk group and trunk group 94 is an incoming trunk group.

```
ADD N1TG: TG=93, EID="211.169.150.47:2944", G=IN, SRC=93, SN="R2", TGN="To
K_office", CSM=CYC, RCHS=255, OTCS=99, ECM=NONE;
ADD N1TG: TG=94, EID="211.169.150.47:2944", G=IN, SRC=93, SN="R2", TGN="To
K_office", CSC=0, CSM=CYC, RCHS=88, OTCS=255, ECM=NONE;
```

 Note:

- Because destination code charging is used in the local office for outgoing and incoming calls from the PBX subscribers, for the outgoing trunk group, the "Outgoing trunk charging source code" cannot be 255, but 99 here. As for the incoming trunk group, the parameter "Charging source code" must be set to 88, but not 255.
- If the local office is required to charge each PBX subscriber separately, set the parameter "CAMA" of the incoming trunk group to "Yes". It is recommended to discriminate the calling number of the incoming call at the same time to prevent PBX from sending wrong calling numbers.
- To prevent the opposite office from originating incoming calls through the outgoing trunks at the local office side, it is suggested to set the charging source code and outgoing trunk charging source code for both incoming trunk group and outgoing trunk group at the local office side simultaneously,

//Add R2 trunk circuits.

```
ADD N1TKC: MN=23, TG=93, SC=256, EC=287, CS=USE, TID=0;
ADD N1TKC: MN=23, TG=94   , SC=288, EC=319, CS=USE, TID=32;
```

 Note:

- The parameters "start circuit" and "end circuit" in the command are unified logical numbers for No. 7, PRA, R2, or V5 trunk circuits in an FCCU/FCSU of SoftX3000, and their numbers at the UMG8900 side are specified by the parameter "start circuit termination ID".
- The difference between end circuit termination ID and start circuit termination ID must be the integral multiple of 32, for example, 0, 32, 64, and 96.

IV. Configuring number analysis data

//Add a call prefix 3630.

```
ADD CNACLD: PFX=K'3630, CSA=LC, RSC=93, MINL=4, MAXL=7, CHSC=0;
```

☰ **Note:**

- Because 3630 is an outgoing call prefix, the "route selection code" parameter in the command is set to 93, not 65535.
- Because destination code charging is used for the prefix 3630, the "charging selection code" parameter in the command is set to 0, not 65535.

2.16.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and UMG8900 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether UMG8900 has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to see whether UMG8900 has been registered normally, and then decide the next steps according to the returned result.

- If "Normal" is returned, it indicates that the UMG8900 has been registered and its data configuration is correct.
- If "Disconnect" is displayed, it indicates that the UMG8900 has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the UMG8900 has been modified.
- If "Fault" is displayed, it indicates the UMG8900 cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether R2 trunk circuits are normal

Carry out the **DSP N1C** command on the SoftX3000 client to check the status of the relative R2 trunk circuit. If it is abnormal, use the command **LST TG** or **LST TKC** to check whether the equipment ID, start circuit number and start circuit termination ID are configured correctly.

IV. Testing service by making a call

If no problem is found in the preceding checks, make a call to a PBX subscriber to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise,
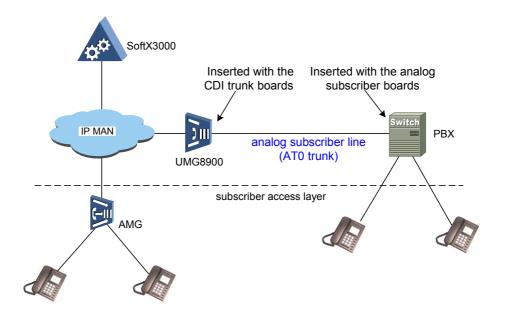
- Carry out the commands **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT** and **LST TG** one by one to check whether the routing selection code, route number, sub-route number and trunk group number are configured correctly.
- Check whether the data configuration at PBX side is correct if the data at SoftX3000 side is configured correctly.

2.17 Configuring Data for Interconnecting with PBX (through AT0 Trunk)

2.17.1 Introduction

I. Typical networking model

AT0 trunk, a circuit in broad sense, is actually an analog subscriber line used for the Direct Dial In (DDI) function of PBX. When AT0 trunk is employed in networking, SoftX3000 interconnects with the peer PBX through the common analog subscriber line signaling. The typical networking model is illustrated in Figure 2-18.

Figure 2-18 Typical networking model for SoftX3000 interconnected with PBX (through AT0 trunk)

As shown in Figure 2-18, PBX occupies PSTN number resources, and AT0 trunk can only support uni-directional calls, that is, calls from PSTN (SoftX3000) to PBX.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) 16 AT0 trunks are provided between SoftX3000 and PBX through UMG8900.
2) Subscribers in the SoftX3000 can call PBX subscribers directly (dual-stage dialing is unnecessary).

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the UMG8900 and PBX sides, as shown in Table 2-28 and Table 2-29.

Table 2-28 Interconnection parameters between SoftX3000 and UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248
2	H.248 code type	ASN.1 (binary mode)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of UMG8900 in H.248	211.169.150.48/255.255.0.0
5	Local UDP port number of H.248 at SoftX3000 side	2944
6	Local UDP port number of UMG8900 at SoftX3000 side	2944
7	Speech codecs supported by UMG8900	G.711A, G.711μ, G.723.1, G.729A
8	Whether UMG8900 supports hairpin connection	Supported
9	Whether UMG8900 supports T.38	Supported
10	Termination ID range for the CDI of UMG8900	128–143

Table 2-29 Interconnection parameters between SoftX3000 and PBX

Serial No.	Parameter	Value
1	AT0 trunk circuit selection mode	Minimum line selection mode

Serial No.	Parameter	Value
2	Number segment of PBX subscribers	3650000–3650999

2.17.2 Script

I. Configuring MG data

//Add a UMG8900. The equipment ID is 211.169.150.48:2944.

```
ADD MGW: EID="211.169.150.48:2944", GWTP=UMGW, MGWDESC="ShenZhen-UMG8900-06",
MGCMODULENO=23,    LA="191.169.150.30",    RA1="211.169.150.48",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

 Note:

- If the UMG8900 acts as an AG or TG, the parameter "Equipment ID" in the command must be in the format of "IP address: port number" and "Gateway type" must be set to "UMGW".
- Because H.248 of the UMG8900 only supports binary mode, the parameter "Code type" in the command must be set to "ASN.1".
- The UMG8900 in the example supports hairpin connection, so the parameter "Hairpin connection" must be set to "Supported"; Otherwise, it must be set to "Not Supported". Wrong setting will result in call failure.

II. Configuring routing data

//Add an office direction. Set "peer office type" to PBX and "office direction number" to "95".

```
ADD OFC: O=95, ON="DDI_office", DOT=PBX, DOL=LOW, METHOD=NOCONV;
```

 Note:

- Because alternative path routing for office of the same level must be avoided, and "peer office type" is "PBX", peer office level should be set to "inferior".
- You do not need to specify the DPC parameters because no No. 7 trunk circuits are included in the office direction.

//Add a sub-route. Set "sub-route number" to "95".

```
ADD SRT: SRC=95, O=95, SRN="To DDI_office", TSM=CYC;
```

//Add a route. Set "route number" to "95".

```
ADD RT: R=95, RN="To DDI_office", SR1=95;
```

//Add analysis of route to PBX. Set "route selection code" to "95".

```
ADD RTANA: RSC=95, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=95,
ISUP=NOCHG;
```

III. Configuring AT0 trunk data

//Add an AT0 trunk group.Set "trunk group number" to "95" and "group direction" to "outgoing trunk".

```
ADD  AT0TG:  TG=95,  G=OUT,  EID="211.169.150.48:2944",  SRN=95,  TGN="To
DDI_office", CSM=MIN;
```

📖 **Note:**

- You must set "Circuit selection mode" to "Minimum " for AT0 trunks. If you select other modes, the call connection will fail.
- Generally, you need to set "DOD2" to "False" when the AT0 trunk is used in DDI networking of PBX.
- Set the duration of the timers to the default values. Do not modify them unless there are special requirements.

//Add an AT0 trunk circuit.

```
ADD AT0TKC: MN=23, TG=95, SC=320, EC=335, TID=128;
```

📖 **Note:**

The "Start circuit termination ID" specified here is the termination ID of port 0 of the CDI at the UMG8900 side.

IV. Configuring number analysis data

//Add called number analysis. Set "call prefix" to "3650".

```
ADD CNACLD: PFX=K'3650, CSA=LC, RSC=95, MINL=4, MAXL=7, CHSC=0;
```

 📖 **Note:**

- You must not set "route selection code" to 65535 (it is 95 here) because 3650 is an outgoing call prefix.
- You must not set "Charging selection code" to 65535" (it is 0 here) because destination code charging is used to charge the call prefix 3650.

2.17.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the UMG8900 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the UMG8900has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the UMG8900 has been registered normally, and then decide the next steps according to the returned result.

1) If "normal" is returned, it indicates that the UMG8900 has been registered and its data configuration is correct.
2) If "disconnect" is displayed, it indicates that the UMG8900 has been registered but is out of service now. In this case, check whether the related data at either side has been modified.
3) If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether such parameters as equipment ID, peer IP address, peer port number, and code type are correctly configured.

III. Testing service by making a call

If the preceding check indicates normality and correctness, originate a call from the SoftSwitch to the PBX. If the call is made successfully, it indicates that the data is configured correctly. Otherwise, do the following:

1) Use **LST CNACLD**, **LST RTANA**, **LST RT**, **LST SRT**, and **LST TG** to check whether the parameter referencing relationship among route selection code, route number, sub-route number, and trunk group number is configured correctly.
2) Check whether data is configured correctly at the PBX side if no data configuration errors are found at SoftX3000 side.

2.18 Configuring Data for Interconnecting with PBX (through Loop Trunk)

2.18.1 Introduction

I. Typical networking model

PBX can be interconnected with SoftX3000 through loop trunks in certain applications. At SoftX3000 side, the loop trunks are actually analog subscriber lines provided by the IAD or AMG that is controlled by SoftX3000. A typical networking model is illustrated in Figure 2-19.

Figure 2-19 Typical networking model for SoftX3000 interconnected with PBX (through loop trunk)

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1)   16 loop trunks are provided between SoftX3000 and the PBX through an IAD.
2)   Subscribers in the SoftSwitch call PBX subscribers through a pilot number (sometimes called indicating number).

III. Interconnection parameters

Before configuring data at SoftX3000 side, make sure the following interconnection parameters have been negotiated with the IAD (through MGCP) and PBX sides, as shown in Table 2-30 and Table 2-31.

Table 2-30 Interconnection parameters between SoftX3000 and IAD

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and IAD	MGCP
2	MGCP code type	ABNF (text format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of IAD	211.169.150.49/255.255.0.0
5	Domain name of IAD	ShenZhen-iad0132-02.com
6	Local UDP port number of MGCP at SoftX3000 side	2727
7	Local UDP port number of MGCP at IAD side	2427
8	Interface name of IAD	aaln
9	Numbering plan of termination ID (subscriber port) of IAD	Starting from 0
10	Speech codecs supported by IAD	G.711A, G.711③, G.723.1, G.729A
11	Whether IAD supports hairpin connection	Not supported
12	Whether IAD supports EC function	Supported
13	Whether IAD supports the detection of fax and modem signal tone	Supported
14	Whether IAD supports the T.38 protocol	Not supported
15	Telephone numbers assigned for subscriber lines from IAD	6540100 ~ 6540115
16	Termination IDs assigned for subscriber lines from IAD	0 ~ 15

Table 2-31 Interconnection parameters between SoftX3000 and PBX

Serial No.	Parameter	Value
1	PBX pilot number	6540101

2	Telephone numbers assigned for PBX subscriber group	6540120–6540125

2.18.2 Script

I. Configuring MG data

//Add an IAD adopting MGCP. The equipment ID is ShenZhen-iad0132-02.com.

```
ADD         MGW:         EID="ShenZhen-iad0132-02.com",         GWTP=IAD,
MGWDESC="shenzhen-iad132-02",         MGCMODULENO=22,         PTYPE=MGCP,
LA="191.169.150.30",         RA1="211.169.150.49",         RP=2427,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, UCATT=NOFX-0&NOM-0;
```

 Note:

- When the IAD adopts MGCP, the "equipment ID" parameter in the command is specified in the format of domain name. It is recommended to name the domain in "office name-MG type-number" mode. Here, the equipment ID is "ShenZhen-iad0132-02.com".
- When the gateway is an AG or an IAD, the default value of "TDM termination ID prefix index" is 2, indicating that the TDM termination ID (that is, the interface name) is the default value, "aaln/".

II. Configuring PBX service data

//Add a PBX subscriber group. The PBX pilot number (also called PBX indicating number) is 6540101.

```
ADD PBX: GDN=K'6540101, LP=0;
```

III. Configuring subscriber data

//Add PBX subscribers. The subscriber status defined for all subscribers is "PBX subscriber occupying number resources". The PBX pilot number is 6540101.

```
ADB   VSBR:   SD=K'6540120,   ED=K'6540125,   LP=0,   MN=22,   DID=ESL,
EID="ShenZhen-iad0132-02.com", STID=0, CODEC=PCMA, RCHS=65, CSC=0, AUT=PBXD,
NS=CLIP-1, GDN=K'6540101;
```

 Note:

The PBX pilot number 6540101 cannot be defined as a PBX subscriber.

IV. Configuring number analysis data

//Add a call prefix.

```
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
```

2.18.3 Commissioning Guideline

After completing the preceding configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the IAD is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the IAD has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the IAD has been registered normally, and then decide the next steps according to the returned result.

1) If "normal" is returned, it indicates that the IAD has been registered and its data configuration is correct.
2) If "disconnect" is displayed, it indicates that the IAD registered but is out of service now. In this case, check whether the related data at either side has been modified.
3) If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether the IAD subscribers are normal

If the IAD is registered successfully, make a call inside the IAD to test its service. If the call is normal, it indicates that the data configuration is correct. Otherwise, do the following:

1) Use the **DSP EPST** command to check whether the terminations of the IAD have been registered. If not, use the **LST VSBR** command to check whether the module number, equipment ID, and termination ID are configured correctly.
2) Check whether data is configured correctly at the IAD side if no data configuration errors are found at SoftX3000 side.

IV. Testing service by making a call

Multiple subscribers dial the PBX pilot number at the same time. If less than 32 calls attempt to be connected or are already connected, the busy tone should not be played to any calling subscriber. Otherwise, use the **LST VSBR** command to check whether the "PBX indicating number" parameter is correctly configured for the subscribers.

Chapter 3 MRS Related Configurations

3.1 Configuring Basic Data

During the configuration, the MRS resource data is closely related to the equipment data. For description purpose, the basic data configuration of this chapter only covers equipment data configuration.

3.1.1 Interconnection parameters

I. Equipment configuration

In this example, SoftX3000 is only configured with one basic frame, located in frame 2 in the integrated configuration cabinet. Figure 3-1 shows its configuration.

Back boards	BFII	BFII					SIUI	HSCI	SIUI	HSCI								UPWR		UPWR	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Front boards	IFMI	IFMI	FCCU	FCCU			SMUI		SMUI		BSGI	BSGI	MSGI	MSGI	CDBI	CDBI	ALUI	UPWR		UPWR	
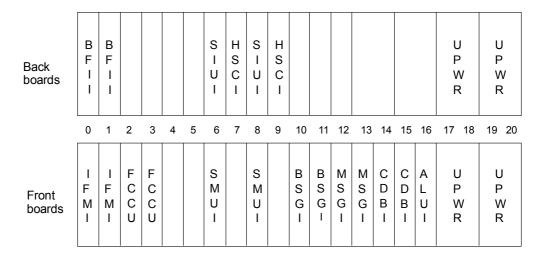
Figure 3-1 Equipment configuration

II. Basic information of major boards

Table 3-1 Basic information of major boards

Frame No./Slot No.	Position	Type	Active/standby	Module No.
0 / 0	Front	IFMI	Active	132
0 / 1	Front	IFMI	Standby	132
0 / 2	Front	FCCU	Active	22

Frame No./Slot No.	Position	Type	Active/standby	Module No.
0 / 3	Front	FCCU	Standby	22
0 / 10	Front	BSGI	Work independently	136
0 / 11	Front	BSGI	Work independently	137
0 / 12	Front	MSGI	Active	211
0 / 13	Front	MSGI	Standby	211
0 / 14	Front	CDBI	Active	102
0 / 15	Front	CDBI	Standby	102

III. IP address of FE port

The IP address of the FE port is 191.169.150.30/255.255.0.0.

3.1.2 Script

I. Getting offline

//Get offline.

```
LOF:;
```

//Set alarm switch to "Off".

```
SET CWSON: SWT=OFF;
```

//Set format conversion switch to "OFF".

```
SET FMT: STS=OFF;
```

II. Configuring equipment data

//Add a rack numbered 0.

```
ADD SHF: SN=0, LT="ShenZhen-SoftX3000", PN=0, RN=0, CN=0, PL=2;
```

 Note:

Because the integrated configuration cabinet is configured with only one basic frame in this example, and the position number of the basic frame is 2, the "PDB Location" parameter in the command can be set only to 2, that is, the basic frame controls the Power Distribution Box (PDB).

//Add a frame numbered 0 in the position 2.

```
ADD FRM: FN=0, SN=0, PN=2;
```

☐ Note:

For the basic frame in the integrated configuration cabinet, it is fixed that its frame number is 0 and position number in the rack is 2.

```
//Add boards. (Assisting boards are inserted in adjacent slots.)
ADD BRD: FN=0, SN=0, LOC=FRONT, BT=IFMI, MN=132, ASS=1;
ADD BRD: FN=0, SN=2, LOC=FRONT, BT=FCCU, MN=22, ASS=3;
ADD BRD: FN=0, SN=10, LOC=FRONT, BT=BSGI, MN=136, ASS=255;
ADD BRD: FN=0, SN=11, LOC=FRONT, BT=BSGI, MN=137, ASS=255;
ADD BRD: FN=0, SN=12, LOC=FRONT, BT=MSGI, MN=211, ASS=13;
ADD BRD: FN=0, SN=14, LOC=FRONT, BT=CDBI, MN=102, ASS=15;
```

☐ Note:

1) The BSGIs are configured to work in load sharing mode generally, that is, one module number is configured for one board, so the parameter "assist slot number" in the command must be set to 255.

2) SoftX3000 also supports that the BSGIs work in active & standby mode. However, the BSGIs do not support Q.931 protocol (call processing adaptation module) and they need not save the information of the established calls, so it is unnecessary to configure them to work in active & standby mode. To enhance the resource utilization rate of the equipment, it is recommended to set the BSGIs to work in load sharing mode.

3) The module number configuration of each board is suggested as follows:

- The module number of the SMUI: from 2 to 21 in ascending order.
- The module number of the FCCU: from 22 to 101 in ascending order.
- The module number of the UCSI: from 101 to 22 in descending order.
- The module number of the CDBI: from 102 to 131 in ascending order.
- The module number of the IFMI: from 132 to 135 in ascending order.
- The module number of the BSGI: from 136 to 211 in ascending order.
- The module number of the MSGI: from 211 to 136 in descending order.
- The module number of the MRCA: from 212 to 247 in ascending order.

//Add an FE port configuration of the IFMI. (The default gateway address is the IP address of the associated router.)

```
ADD        FECFG:        MN=132,IP="191.169.150.30",        MSK="255.255.0.0",
DGW="191.169.150.60", EA=AUTO;
```

📖 **Note:**

It is required to correctly set the IP address of the default router (gateway) of the FE port; otherwise, SoftX3000 cannot communicate with IP devices.

//Add all central database functions.

```
ADD CDBFUNC: CDPM=102, ADD CDBFUNC: CDPM=102,
FCF=LOC-1&TK-1&MGWR-1&BWLIST-1&IPN-1&DISP-1&SPDNC-1&RACF-1&PRESEL-1&UC-1&K
S-1;
```

📖 **Note:**

When two pairs of CDBI are configured, database functions will be shared by them in load sharing mode. If only one pair of CDBI is configured, it must be configured with all database functions.

III. Converting data format and getting online

//Set format conversion switch to "ON".

```
SET FMT: STS=ON;
```

//Format data.

```
FMT:;
```

//Set alarm switch to "ON".

```
SET CWSON: SWT=ON;
```

//Get online.

```
LON:;
```

3.2 Configuring Data for Interconnecting with Embedded MRS

3.2.1 Introduction

I. Configuration description

Because the embedded MRS is a component of SoftX3000, it is required to configure the data at both the embedded MRS side and SoftX3000 side to make SoftX3000 interconnected with the embedded MRS. The MRS side data includes equipment data and MGC data, and SoftX3000 side data includes MG data and MRS resource data.

II. Equipment configuration

In the actual deployment, all boards of the embedded MRS generally occupy a frame. In normal cases, it is in frame 3 in the integrated configuration cabinet. When two MRCA boards are configured, the embedded MRS configuration is shown in Figure 3-2.

Back boards	MRIA	MRIA					SIUI	HSCI	SIUI	HSCI								UPWR		UPWR	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Front boards	MRCA	MRCA					SMUI		SMUI								ALUI	UPWR		UPWR	
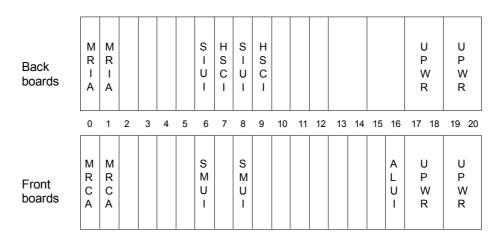
Figure 3-2 Configuration of embedded MRS

III. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side.

1) SoftX3000 can play basic announcements and supplementary service announcements.

2) SoftX3000 can support announcement playback and digit collection functions for Intelligent Network (IN) service.

IV. Interconnection parameters

Before configuring the data at SoftX3000 side, plan the following interconnection parameters, as shown in Table 3-2.

Table 3-2 Parameters for SoftX3000 interconnecting with embedded MRS

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and MRS	MGCP
2	MGCP code type	ABNF (text format)
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	Local UDP port number of MGCP at SoftX3000 side	2727
5	Local UDP port number of MGCP at embedded MRS side	2427
6	Whether embedded MRS supports EC function	Supported
7	Speech codecs supported by embedded MRS	G.711A, G.711μ, G.723.1, G.729A
8	Internal IP address of the MRCA in slot 0	172.20.200.212/255.255.0.0
9	Domain name of the MRCA in slot 0	mrc212.huawei.com
10	Interface name of the MRCA in slot 0	ms/cnf
11	Internal IP address of the MRCA in slot 1	172.20.200.213/255.255.0.0
12	Domain name of the MRCA in slot 1	mrc213.huawei.com
13	Interface name of the MRCA in slot 1	ms/cnf

3.2.2 Script

I. Configuring data at embedded MRS side (including equipment data and MGC data)

//Add a frame numbered 1 in the position 3.

```
ADD FRM: FN=1, SN=0, PN=3;
```

//Add two MRCA boards.

```
ADD BRD: FN=1, SN=0, LOC=FRONT, BT=MRCA, MN=212, ASS=255;
```

```
ADD BRD: FN=1, SN=1, LOC=FRONT, BT=MRCA, MN=213, ASS=255;
```

📖 **Note:**

Because the MRCA board does not active/standby working mode, the parameter "Assist slot number" in the command must be set to "255".

//Add configuration information of MRCA, with MGC IP address as 191.169.150.30, local port number at MGC side as 2727, and local port number at MRC side as 2427.

```
ADD MRCCFG: MN=212, DFL=CHI, MGCP=2727, MRCP=2427, MRCDN="mrc212.huawei.com",
MGCIP4="191.169.150.30", MGCMODULENO=22;
ADD MRCCFG: MN=213, DFL=CHI, MGCP=2727, MRCP=2427, MRCDN="mrc213.huawei.com",
MGCIP4="191.169.150.30", MGCMODULENO=22;
```

📖 **Note:**

- The IP address of the MGC must be the IP address of the FE port on the corresponding IFMI board.
- In the actual networking, one MRCA board is equivalent to an MRS. In this case, you need to configure every MRCA board.
- In this command, the default value of "TDM termination ID prefix index" is 3, indicating that the TDM termination ID (that is, the interface name) is the default value, "ms/cnf/".

//Add configuration information of MRP subboard.

```
ADD MRPCFG: MBID=212, BID=LMRPB, MIP="191.169.150.201", IPM="255.255.0.0",
MRPDR="191.169.150.253";
ADD MRPCFG: MBID=212, BID=UMRPB, MIP="191.169.150.202", IPM="255.255.0.0",
MRPDR="191.169.150.253";
ADD MRPCFG: MBID=213, BID=LMRPB, MIP="191.169.150.203", IPM="255.255.0.0",
MRPDR="191.169.150.253";
ADD MRPCFG: MBID=213, BID=UMRPB, MIP="191.169.150.204", IPM="255.255.0.0",
MRPDR="191.169.150.253";
```

 Note:

● The IP address of the MRP subboard must be an IP address of PSTN, and cannot be repeated with others.

● It is required to correctly set the IP address of the default router (gateway) of the MRP subboard; otherwise, the embedded MRS cannot play announcements normally.

//Load voice files to the embedded MRS. (The loaded files here are part of voice files.)

```
ADD MRCV: FN="HWF0010004.chi", UMF=1;
ADD MRCV: FN="HWF0010005.chi", UMF=1;
ADD MRCV: FN="HWF0010006.chi", UMF=1;
ADD MRCV: FN="HWF0010007.chi", UMF=1;
ADD MRCV: FN="HWF0010008.chi", UMF=1;
ADD MRCV: FN="HWF0010009.chi", UMF=1;
ADD MRCV: FN="HWF001000B.chi", UMF=1;
ADD MRCV: FN="HWF001000C.chi", UMF=1;
ADD MRCV: FN="HWF001000D.chi", UMF=1;
ADD MRCV: FN="HWF001002E.chi", UMF=1;
ADD MRCV: FN="HWF0010030.chi", UMF=1;
ADD MRCV: FN="HWF0010031.chi", UMF=1;
ADD MRCV: FN="HWF0010032.chi", UMF=1;
ADD MRCV: FN="HWF0010033.chi", UMF=1;
ADD MRCV: FN="HWF0010035.chi", UMF=1;
ADD MRCV: FN="HWF0010036.chi", UMF=1;
ADD MRCV: FN="HWF001012C.chi", UMF=1;
ADD MRCV: FN="HWF001012D.chi", UMF=1;
ADD MRCV: FN="HWF001012F.chi", UMF=1;
ADD MRCV: FN="HWF0010130.chi", UMF=1;
ADD MRCV: FN="HWF0010200.chi", UMF=1;
ADD MRCV: FN="HWF0010201.chi", UMF=1;
ADD MRCV: FN="HWF0010203.chi", UMF=1;
ADD MRCV: FN="HWF0010207.chi", UMF=1;
ADD MRCV: FN="HWF0010209.chi", UMF=1;
ADD MRCV: FN="HWF001020A.chi", UMF=1;
ADD MRCV: FN="HWF001020C.chi", UMF=1;
ADD MRCV: FN="HWF001020D.chi", UMF=1;
ADD MRCV: FN="HWF001020E.chi", UMF=1;
ADD MRCV: FN="HWFF800002.chi", UMF=1;
ADD MRCV: FN="HWFF80001C.chi", UMF=1;
ADD MRCV: FN="HWFF80007E.chi", UMF=1;
```

```
ADD MRCV: FN="HWFF400002.eng", UMF=1;

ADD MRCV: FN="HWFF40001C.eng", UMF=1;

ADD MRCV: FN="HWFF40007E.eng", UMF=1;
```

📖 **Note:**

Because there are hundreds of voices files to be loaded, there might be hundreds of script files to be compiled when loading voice files to the embedded MRS by the command **ADD MRCV**. To prevent error and save time, SoftX3000 has configured the corresponding script files in the directory D:\Data\voice in the BAM hard disk to make it possible to use these files directly. If it is required to load all voice files to the embedded MRS, use the file "mrc all voice file script.txt".

II. Configuring data at SoftX3000 side (MRS resource data)

//Add mapping between uncommonly used tone IDs and voice files. (This operation is optional. The equipment ID of the MRS is mrc212.huawei.com.)

```
ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0X0003, FILENAME=3;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0X000A, FILENAME=10;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x002f, FILENAME=47;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0204, FILENAME=516;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0205, FILENAME=517;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0206, FILENAME=518;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x020f, FILENAME=527;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0211, FILENAME=529;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0212, FILENAME=530;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0213, FILENAME=531;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0214, FILENAME=532;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0216, FILENAME=534;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0218, FILENAME=536;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x021a, FILENAME=538;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x021b, FILENAME=539;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x021c, FILENAME=540;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x021d, FILENAME=541;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x021e, FILENAME=542;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0220, FILENAME=544;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0223, FILENAME=547;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0224, FILENAME=548;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0225, FILENAME=549;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0100, FILENAME=256;
```

```
ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0103, FILENAME=259;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0104, FILENAME=260;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0105, FILENAME=261;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0106, FILENAME=262;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0107, FILENAME=263;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0108, FILENAME=264;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x010a, FILENAME=266;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x010b, FILENAME=267;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x010c, FILENAME=268;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x010d, FILENAME=269;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x010e, FILENAME=270;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x010f, FILENAME=271;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0110, FILENAME=272;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0111, FILENAME=273;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0112, FILENAME=274;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0113, FILENAME=275;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0114, FILENAME=276;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0115, FILENAME=277;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0116, FILENAME=278;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0117, FILENAME=279;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0118, FILENAME=280;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0119, FILENAME=281;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x011a, FILENAME=282;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x011b, FILENAME=283;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x011c, FILENAME=284;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x011d, FILENAME=285;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x011e, FILENAME=286;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x011f, FILENAME=287;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0120, FILENAME=288;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0121, FILENAME=289;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0122, FILENAME=290;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0123, FILENAME=291;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0124, FILENAME=292;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0125, FILENAME=293;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0126, FILENAME=294;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0127, FILENAME=295;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0128, FILENAME=296;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x0129, FILENAME=297;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x012a, FILENAME=298;

ADD TONEID: EID="mrc212.huawei.com", TONEID=TID_0x012b, FILENAME=299;
```

 Note:

By default, the system automatically adds the mapping table (33 records) for the tone IDs and voice files after using the **ADD MRCCFG** command to add MRS gateway. If it is required to add the mapping relationships between all tone IDs and voice files, use the above script.

//Add mapping between uncommonly used tone IDs and voice files. (This operation is optional. The equipment ID of the MRS is mrc213.huawei.com.)

```
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0X0003, FILENAME=3;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0X000A, FILENAME=10;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x002f, FILENAME=47;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0204, FILENAME=516;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0205, FILENAME=517;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0206, FILENAME=518;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x020f, FILENAME=527;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0211, FILENAME=529;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0212, FILENAME=530;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0213, FILENAME=531;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0214, FILENAME=532;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0216, FILENAME=534;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0218, FILENAME=536;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x021a, FILENAME=538;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x021b, FILENAME=539;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x021c, FILENAME=540;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x021d, FILENAME=541;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x021e, FILENAME=542;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0220, FILENAME=544;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0223, FILENAME=547;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0224, FILENAME=548;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0225, FILENAME=549;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0100, FILENAME=256;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0103, FILENAME=259;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0104, FILENAME=260;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0105, FILENAME=261;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0106, FILENAME=262;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0107, FILENAME=263;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0108, FILENAME=264;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x010a, FILENAME=266;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x010b, FILENAME=267;
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x010c, FILENAME=268;
```

```
ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x010d, FILENAME=269;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x010e, FILENAME=270;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x010f, FILENAME=271;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0110, FILENAME=272;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0111, FILENAME=273;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0112, FILENAME=274;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0113, FILENAME=275;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0114, FILENAME=276;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0115, FILENAME=277;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0116, FILENAME=278;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0117, FILENAME=279;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0118, FILENAME=280;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0119, FILENAME=281;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x011a, FILENAME=282;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x011b, FILENAME=283;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x011c, FILENAME=284;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x011d, FILENAME=285;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x011e, FILENAME=286;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x011f, FILENAME=287;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0120, FILENAME=288;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0121, FILENAME=289;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0122, FILENAME=290;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0123, FILENAME=291;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0124, FILENAME=292;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0125, FILENAME=293;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0126, FILENAME=294;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0127, FILENAME=295;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0128, FILENAME=296;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x0129, FILENAME=297;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x012a, FILENAME=298;

ADD TONEID: EID="mrc213.huawei.com", TONEID=TID_0x012b, FILENAME=299;
```

 Note:

By default, the system automatically adds the mapping table (33 records) for the tone
IDs and voice files after using the **ADD MRCCFG** command to add MRS gateway. If it is
required to add the mapping relationships between all tone IDs and voice files, use the
above script.

3.2.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connections between SoftX3000 and IP addresses (internal addresses) of the MRCA boards, IP addresses (external addresses) of MRP subboards are normal. If the connections are normal, proceed with the subsequent steps. If the connections are abnormal, use the commands **LST MGW** and **LST MRPCFG** to check whether the IP address parameters are configured correctly.

II. Checking whether each MRS has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether each MRS has been registered normally, and then decide the next steps according to the returned result.

1) If "Normal" is returned, it indicates that the MRS has been registered and its data configuration is correct.
2) If "Disconnect" is displayed, it indicates that the MRS has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the MRS has been modified.
3) If "Fault" is displayed, it indicates the MRS cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing announcement playback and digit collection by dialing

If the MRS is registered, test its services, such as signal tones, supplementary service announcements, and IN service announcements by dialing the service prefixes. For detailed operation methods, see *U-SYS SoftX3000 SoftSwitch System Technical Manual–Service Application.* If the MRS cannot play announcements or it is abnormal, execute the following operations.

1) Exectute the **DSP MRCWFILE** and **DSP MRPAWFILE** commands to check whether the corresponding voice files have been loaded successfully.
2) Execute the **LST TONEID** command to check whether the corresponding tone IDs and voice files are mapped correctly.
3) Execute the **LST MGW** command to check whether the quantity of service tone resources, the quantity of multi-party tone resources, the quantity of DTMF detection resources, the quantity of DTMF transmission resources, code type, and interface name are correctly configured.
4) Start MGCP tracing task in the interface track task on the U-SYS SoftX3000 Client and observe the MGCP message packets between SoftX3000 and MRS to check

whether SoftX3000 can send announcement playback instruction to the MRS and whether the played announcement is correct.

3.3 Configuring Data for Interconnecting with MRS6100

3.3.1 Introduction

I. Typical networking model

SoftX3000 usually adopts MGCP as the control protocol to interconnect with MRS6100. Figure 3-3 illustrates the typical networking model.

Figure 3-3 Typical networking model for SoftX3000 interworking with MRS6100

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) SoftX3000 can play basic announcements and supplementary service announcements.
2) SoftX3000 supports announcement and digit collection functions for IN services.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate the following interconnection parameters as shown in Table 3-3 with the MRS6100 side.

Table 3-3 Parameters for SoftX3000 interworking with MRS6100

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and MRS6100	MGCP
2	MGCP code type	ABNF

Serial No.	Parameter	Value
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of the MCCU of MRS6100	191.169.150.61/255.255.0.0
5	Local UDP port number of MGCP at SoftX3000 side	2727
6	Local UDP port number of MGCP at MRS6100 side	2427
7	MRS6100 domain name	mrs6100.huawei.com
8	MRS6100 interface name	ms/cnf
9	Whether MRS6100 supports EC function	Supported
10	Speech codecs supported by MRS6100	G.711A, G.711μ, G.723.1, G.729A

3.3.2 Script

//Add one MRS gateway. The equipment ID is mrs6100.huawei.com.

```
ADD    MGW:    EID="mrs6100.huawei.com",    GWTP=MRS,    MGWDESC="MRS6100",
MGCMODULENO=22,         LA="191.169.150.30",         RA1="191.169.150.61",
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1, RATEOFTONE=400, RATEOFMPTY=400,
RATEOFDETECTDTMF=400, RATEOFSENDDTMF=400;
```

 Note:

- The "Equipment ID" parameter in the command must be consistent with the domain name of the MCCU of the MRS6100, and the "Interface name1" parameter must be specified as "ms/cnf".
- The "Remote address1" parameter in the command must be the internal IP address of the MCCU of the MRS6100.
- When "gateway type" is "media resource server", the default value of "TDM termination ID prefix index" is 3, indicating that the TDM termination ID (that is, the interface name) is the default value, "ms/cnf/".

//Add mapping between uncommonly used tone IDs and voice files. (This operation is optional. The equipment ID of the MRS is mrs6100.huawei.com.)

```
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0X0003, FILENAME=3;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0X000A, FILENAME=10;
```

```
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x002f, FILENAME=47;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0204, FILENAME=516;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0205, FILENAME=517;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0206, FILENAME=518;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x020f, FILENAME=527;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0211, FILENAME=529;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0212, FILENAME=530;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0213, FILENAME=531;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0214, FILENAME=532;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0216, FILENAME=534;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0218, FILENAME=536;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x021a, FILENAME=538;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x021b, FILENAME=539;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x021c, FILENAME=540;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x021d, FILENAME=541;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x021e, FILENAME=542;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0220, FILENAME=544;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0223, FILENAME=547;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0224, FILENAME=548;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0225, FILENAME=549;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0100, FILENAME=256;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0103, FILENAME=259;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0104, FILENAME=260;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0105, FILENAME=261;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0106, FILENAME=262;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0107, FILENAME=263;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0108, FILENAME=264;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x010a, FILENAME=266;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x010b, FILENAME=267;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x010c, FILENAME=268;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x010d, FILENAME=269;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x010e, FILENAME=270;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x010f, FILENAME=271;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0110, FILENAME=272;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0111, FILENAME=273;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0112, FILENAME=274;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0113, FILENAME=275;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0114, FILENAME=276;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0115, FILENAME=277;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0116, FILENAME=278;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0117, FILENAME=279;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0118, FILENAME=280;

ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0119, FILENAME=281;
```

```
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x011a, FILENAME=282;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x011b, FILENAME=283;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x011c, FILENAME=284;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x011d, FILENAME=285;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x011e, FILENAME=286;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x011f, FILENAME=287;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0120, FILENAME=288;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0121, FILENAME=289;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0122, FILENAME=290;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0123, FILENAME=291;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0124, FILENAME=292;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0125, FILENAME=293;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0126, FILENAME=294;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0127, FILENAME=295;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0128, FILENAME=296;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x0129, FILENAME=297;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x012a, FILENAME=298;
ADD TONEID: EID="mrs6100.huawei.com", TONEID=TID_0x012b, FILENAME=299;
```

Note:

By default, the system automatically adds the mapping table (33 records) between tone IDs and voice files after the **ADD MGW** command is used to add an MRS gateway. If it is required to add the mapping between all tone IDs and voice files, use the above script.

3.3.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and MRS6100 is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, use the command **LST MGW** to check whether the related IP addresses are configured correctly.

II. Checking whether each MRS has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether each MRS has been registered normally, and then decide the next steps according to the returned result.

1) If "Normal" is returned, it indicates that the MRS has been registered and its data configuration is correct.
2) If "Disconnect" is displayed, it indicates that the MRS has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the MRS has been modified.
3) If "Fault" is displayed, it indicates the MRS cannot be registered. In this case, use the LST MGW command to check whether such parameters as equipment ID, peer IP address, peer port number and code type are correctly configured.

III. Testing announcement and digit collection by making a call

If the MRS is registered successfully, test its services, such as signal tones, supplementary service announcements, and IN service announcements by dialing the service prefixes. For detailed operation methods, see *U-SYS SoftX3000 SoftSwitch System Technical Manual–Service Application.* If the MRS cannot play announcements or plays wrong announcements, execute the following operations:

1) Check whether the corresponding voice files at the MRS6100 have been loaded successfully.
2) Execute the LST TONEID command to check whether the corresponding tone IDs and voice files are mapped correctly.
3) Execute the LST MGW command to check whether the quantity of service tone resources, the quantity of multi-party tone resources, the quantity of DTMF detection resources, the quantity of DTMF transmission resources, coding type, and interface name are correctly configured.
4) Start MGCP tracing task on the U-SYS SoftX3000 Client and observe the MGCP messages between SoftX3000 and MRS to check whether the SoftX3000 can send an announcement instruction to the MRS and whether the played announcement is correct.

3.4 Configuring Data for Interconnecting with MRS6000

3.4.1 Introduction

I. Typical networking model

SoftX3000 usually adopts MGCP as the control protocol to interconnect with MRS6000. Figure 3-4 illustrates the typical networking model.
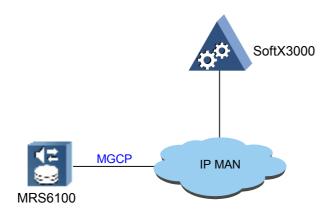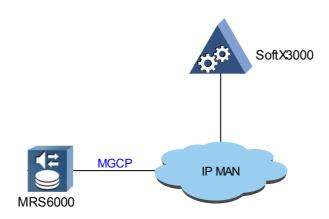
Figure 3-4 Typical networking model for SoftX3000 interworking with MRS6000

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) SoftX3000 can play basic announcements and supplementary service announcements.
2) SoftX3000 can support announcement playback and digit collection functions for IN services.

III. Interconnection parameters

Before configuring the data at SoftX3000 side, negotiate the following interconnection parameters as shown in Table 3-4 with the MRS6000 side.

Table 3-4 Parameters for SoftX3000 interworking with MRS6000

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and MRS6000	MGCP
2	MGCP code type	ABNF
3	IP address of the IFMI of SoftX3000	191.169.150.30/255.255.0.0
4	External IP address of the SCC in MRS6000	191.169.150.60/255.255.0.0
5	Local UDP port number of MGCP at SoftX3000 side	2727
6	Local UDP port number of MGCP at MRS6000 side	2427
7	Whether MRS6000 supports EC function	Supported
8	Speech codecs supported by MRS6000	G.711A, G.711μ, G.723.1, G.729A

Serial No.	Parameter	Value
9	Internal IP address of the MPC in slot 2 at MRS6000 side	182.80.200.102/255.255.0.0
10	Domain name of the MPC in slot 2 at MRS6000 side	mrs102.huawei.com
11	Interface name of the MPC in slot 2 at MRS6000 side	ms/cnf
12	Internal IP address of the MPC in slot 3 at MRS6000 side	182.80.200.103/255.255.0.0
13	Domain name of the MPC in slot 3 at MRS6000 side	mrs103.huawei.com
14	Interface name of the MPC in slot 3 at MRS6000 side	ms/cnf

It should be mentioned that the external IP address of the MPC at the MRS6000 side is used to transmit and receive media streams in Real-time Transport Protocol (RTP). Though it is not used for interconnection with SoftX3000, it must be planned in advance.

3.4.2 Script

//Add two MRS gateways, with equipment IDs as mrs102.huawei.com and mrs103.huawei.com.

```
ADD    MGW:   EID="mrs102.huawei.com",   GWTP=MRS,   MGWDESC="MRS6000",
MGCMODULENO=22,        LA="191.169.150.30",        RA1="182.80.200.102",
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1, RATEOFTONE=400, RATEOFMPTY=400,
RATEOFDETECTDTMF=400, RATEOFSENDDTMF=400;
ADD    MGW:   EID="mrs103.huawei.com",   GWTP=MRS,   MGWDESC="MRS6000",
MGCMODULENO=22,        LA="191.169.150.30",        RA1="182.80.200.103",
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1, RATEOFTONE=400, RATEOFMPTY=400,
RATEOFDETECTDTMF=400, RATEOFSENDDTMF=400;
```

 Note:

- The "Equipment ID" parameter in the command must be consistent with the domain name of the MRCA, and the "Interface name1" parameter must be specified as "ms/cnf".
- In the actual networking, each MPC of the MRS6000 is equivalent to an MRS. In this case, each MPC must be defined as an MRS.
- The "Remote address1" parameter in the command must be the internal IP address of the MPC of the MRS6000. In this example, the remote addresses 1 of the two gateways are 182.80.200.102 and 182.80.200.103.
- Each MPC can provide 1500 channels of service tone resources or multi-party tone resources, or 417 channels of DTMF detection resources or DTMF transmission resources. In normal cases, the parameters "RATEOFTONE", "RATEOFMPTY", "RATEOFDETECTDTMF", and "RATEOFSENDDTMF" can all be set to 400.
- When "gateway type" is "media resource server", the default value of "TDM termination ID prefix index" is 3, indicating that the TDM termination ID (that is, the interface name) is the default value, "ms/cnf/".

//Add MRS route, with gateway IP address as 191.169.150.60.

```
ADD MRSRT: DIP="182.80.200.102", GWIP="191.169.150.60";
ADD MRSRT: DIP="182.80.200.103", GWIP="191.169.150.60";
```

 Note:

- The "Destination IP address" parameter in the command must be the internal IP address of the MPC of the MRS6000.
- The "Gateway IP address" parameter in the command must be the external IP address of the SCC of the MRS6000.

//Add mapping between uncommonly used tone IDs and voice files. (This operation is optional. The equipment ID of the MRS is mrc102.huawei.com.)

```
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0X0003, FILENAME=3;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0X000A, FILENAME=10;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x002f, FILENAME=47;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0204, FILENAME=516;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0205, FILENAME=517;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0206, FILENAME=518;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x020f, FILENAME=527;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0211, FILENAME=529;
```

```
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0212, FILENAME=530;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0213, FILENAME=531;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0214, FILENAME=532;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0216, FILENAME=534;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0218, FILENAME=536;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x021a, FILENAME=538;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x021b, FILENAME=539;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x021c, FILENAME=540;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x021d, FILENAME=541;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x021e, FILENAME=542;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0220, FILENAME=544;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0223, FILENAME=547;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0224, FILENAME=548;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0225, FILENAME=549;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0100, FILENAME=256;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0103, FILENAME=259;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0104, FILENAME=260;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0105, FILENAME=261;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0106, FILENAME=262;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0107, FILENAME=263;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0108, FILENAME=264;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x010a, FILENAME=266;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x010b, FILENAME=267;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x010c, FILENAME=268;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x010d, FILENAME=269;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x010e, FILENAME=270;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x010f, FILENAME=271;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0110, FILENAME=272;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0111, FILENAME=273;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0112, FILENAME=274;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0113, FILENAME=275;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0114, FILENAME=276;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0115, FILENAME=277;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0116, FILENAME=278;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0117, FILENAME=279;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0118, FILENAME=280;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0119, FILENAME=281;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x011a, FILENAME=282;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x011b, FILENAME=283;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x011c, FILENAME=284;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x011d, FILENAME=285;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x011e, FILENAME=286;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x011f, FILENAME=287;
```

```
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0120, FILENAME=288;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0121, FILENAME=289;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0122, FILENAME=290;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0123, FILENAME=291;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0124, FILENAME=292;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0125, FILENAME=293;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0126, FILENAME=294;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0127, FILENAME=295;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0128, FILENAME=296;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x0129, FILENAME=297;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x012a, FILENAME=298;

ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x012b, FILENAME=299;
```

📖 **Note:**

By default, the system automatically adds the mapping table (33 records) between tone IDs and voice files after the **ADD MGW** command is used to add an MRS gateway. If it is required to add the mapping between all tone IDs and voice files, use the above script.

//Add mapping between uncommonly used tone IDs and voice files. (This operation is optional. The equipment ID of the MRS is mrc103.huawei.com.)

```
ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0X0003, FILENAME=3;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0X000A, FILENAME=10;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x002f, FILENAME=47;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0204, FILENAME=516;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0205, FILENAME=517;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0206, FILENAME=518;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x020f, FILENAME=527;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0211, FILENAME=529;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0212, FILENAME=530;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0213, FILENAME=531;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0214, FILENAME=532;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0216, FILENAME=534;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0218, FILENAME=536;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x021a, FILENAME=538;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x021b, FILENAME=539;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x021c, FILENAME=540;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x021d, FILENAME=541;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x021e, FILENAME=542;
```

```
ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0220, FILENAME=544;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0223, FILENAME=547;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0224, FILENAME=548;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0225, FILENAME=549;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0100, FILENAME=256;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0103, FILENAME=259;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0104, FILENAME=260;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0105, FILENAME=261;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0106, FILENAME=262;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0107, FILENAME=263;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0108, FILENAME=264;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x010a, FILENAME=266;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x010b, FILENAME=267;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x010c, FILENAME=268;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x010d, FILENAME=269;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x010e, FILENAME=270;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x010f, FILENAME=271;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0110, FILENAME=272;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0111, FILENAME=273;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0112, FILENAME=274;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0113, FILENAME=275;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0114, FILENAME=276;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0115, FILENAME=277;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0116, FILENAME=278;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0117, FILENAME=279;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0118, FILENAME=280;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0119, FILENAME=281;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x011a, FILENAME=282;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x011b, FILENAME=283;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x011c, FILENAME=284;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x011d, FILENAME=285;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x011e, FILENAME=286;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x011f, FILENAME=287;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0120, FILENAME=288;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0121, FILENAME=289;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0122, FILENAME=290;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0123, FILENAME=291;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0124, FILENAME=292;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0125, FILENAME=293;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0126, FILENAME=294;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0127, FILENAME=295;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0128, FILENAME=296;

ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x0129, FILENAME=297;
```

```
ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x012a, FILENAME=298;
ADD TONEID: EID="mrs103.huawei.com", TONEID=TID_0x012b, FILENAME=299;
```

📖 **Note:**

By default, the system automatically adds the mapping table (33 records) between tone IDs and voice files after the **ADD MGW** command is used to add an MRS gateway. If it is required to add the mapping between all tone IDs and voice files, use the above script.

3.4.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connections between SoftX3000 and IP addresses (external address) of the SCC, IP addresses (internal addresses) of the MPC boards of the MRS6000 are normal. If the connections are normal, proceed with the subsequent steps. If the connections are abnormal, use the commands **LST MGW** and **LST MRSRT** to check whether the IP address parameters are configured correctly.

II. Checking whether each MRS has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether each MRS has been registered normally, and then decide the next steps according to the returned result.

1) If "Normal" is returned, it indicates that the MRS has been registered and its data configuration is correct.
2) If "Disconnect" is displayed, it indicates that the MRS has been registered, but it is out of service. In this case, check whether the related data in SoftX3000 and the MRS has been modified.
3) If "Fault" is displayed, it indicates the MRS cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Testing announcement and digit collection by making a call

If the MRS is registered successfully, test its services, such as signal tones, supplementary service announcements, and IN service announcements by dialing the service prefixes. For detailed operation methods, see *U-SYS SoftX3000 SoftSwitch*

System Technical Manual–Service Application. If the MRS cannot play announcements or plays wrong announcements, execute the following operations:

1) Check whether the corresponding voice files at the MRS6000 have been loaded successfully.

2) Execute the **LST TONEID** command to check whether the corresponding tone IDs and voice files are mapped correctly.

3) Execute the **LST MGW** command to check whether the quantity of service tone resources, the quantity of multi-party tone resources, the quantity of DTMF detection resources, the quantity of DTMF transmission resources, coding type, and interface name are correctly configured.

4) Start MGCP tracing task on the U-SYS SoftX3000 Client and observe the MGCP messages between SoftX3000 and MRS to check whether the SoftX3000 can send an announcement instruction to the MRS and whether the played announcement is correct.

3.5 Configuring Data at MRS6000 Side

The MRS6000 is a media resource server device designed for Next Generation Network (NGN), featuring large capacity and abundant service categories. It is applicable to the offices for large-capacity applications, for example, with 100,000 equivalent subscribers. This example assumes that the hardware configuration of the MRS6000 is as shown in Figure 3-5.
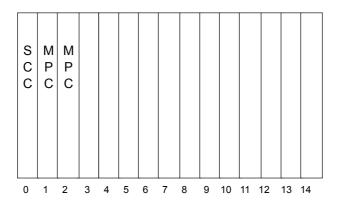
Figure 3-5 MRS6000 hardware configuration

3.5.1 Configuring IP Address of SCC

1) Connect the SCC of the MRS6000 and the serial port of the PC with RS-232 serial port cable, and start the HyperTerminal on the PC. It should be noted that the serial port of the SCC is located on the front slot of the SCC, while that of the MPC is located on the small backplane of the MPC.

2)   Set the properties of the serial port with [Bits per second] as "9600", [Data bits] as
      "8", [Parity] as "None", [Stop bits] as "1" and [Flow control] as "None", as shown in
      Figure 3-6
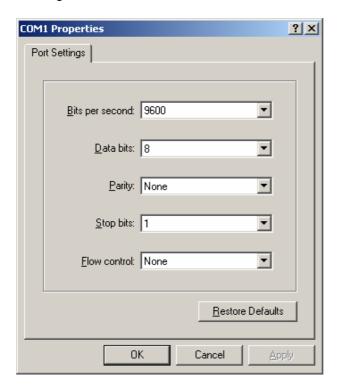
Figure 3-6 Settings of HyperTerminal

3)   After setting the properties of the serial port, click <OK> to connect the PC and the
      MRS6000. The system prompts you to input password (mrs6000 for default
      password) for login. After successful login, the main interface is displayed as
      shown in Figure 3-7.

```
                    Media Server RS-232 Interface

                            Main Menu

         Date and Time
         Network Settings
         Reboot










         Quit

```
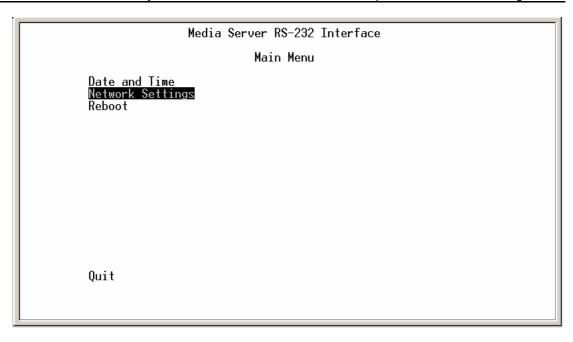
Figure 3-7 Main interface of MRS6000

4)   Select [Network Settings] on the interface and press <Enter>. The system prompts
     the network settings interface (for setting the IP address of the SCC) as shown in
     Figure 3-8.

```
                    Media Server RS-232 Interface

                        Network Settings Menu

     Media Server Hostname:          mrs_

     Port 1 (Ethernet 0) Address:    191.1.11.9
     Port 1 (Ethernet 0) Netmask:    255.255.0.0

     Port 2 (Ethernet 1) Address:    0.0.0.0
     Port 2 (Ethernet 1) Netmask:    0.0.0.0

     Control Interface IP Address:   180.80.200.100
     Control Interface Netmask:      255.255.255.0

     Rte 1 Network: 0.0.0.0          Rte 2 Network: 0.0.0.0
     Rte 1 Netmask: 0.0.0.0          Rte 2 Netmask: 0.0.0.0
     Rte 1 Gateway: 191.1.11.1       Rte 2 Gateway: 0.0.0.0

     Cancel
     Save and Quit

```

Figure 3-8 Configuring network settings of SCC

5)   Use the arrow keys and <Space> to configure the network settings of the SCC.
     After completing settings, click <Save and Quit> at the lower left of the interface.
     As shown in Figure 3-8, the following parameters should be mentioned.

- [Port 1 (Ethernet 0) Address] and [Port 2 (Ethernet 1) Address] are the external IP addresses of the SCC. Generally, they are the IP addresses in the public network.
- [Control Interface IP Address] is the internal IP address of the SCC.

⚠ Caution:

- The internal IP address of the SCC cannot be within either the network segment 172.20.XXX.XXX or 172.30.XXX.XXX, for these two network segments have been used by SoftX3000 internally.
- The internal IP address of the SCC must be within the same network segment as the Control Interface IP Address of the MPC shown in Figure 3-10 and Figure 3-11, so as to facilitate the communication between the SCC and the MPC.

3.5.2 Configuring IP Address of MPC

1) Connect the PC and the SCC of the MRS6000 to a LAN Switch with network cables, start the Internet Explorer on the PC and input "http://*External IP address of the SCC*" in the address box.

2) The system prompts logging in. Input the user name "admin", default password "mrs6000" to log in to the [Media Server Manager] interface as shown in Figure 3-9.

Figure 3-9 [Media Server Manager] web interface of MRS6000

3)   Click [O&M/Media Server Configuration/Commission MPC-II Card] on the
      interface to enter the configuration interface for the MPC. On the interface, set the
      IP addresses of MPC-II card and MPC-III card as shown in Figure 3-10 and
      Figure 3-11, and then click <Execute>.

Figure 3-10 Configuring IP address of MPC-II card

As shown in Figure 3-10, the following parameters should be mentioned.

- "Control interface hostname" is the host name of the MPC-II card. It, together with the domain name of the MRS6000 configured in Figure 3-15, constitutes the message domain name (consistent with the domain name of the MRS configured at SoftX3000 side) of the MPC-II card in the MGCP. For example, if the host name of the MPC-II card is mrsvm, the domain name of the MRS6000 is huawei.com, the message domain name of the MPC-II card in the MGCP is mrsvm.huawei.com.

- "Control interface IP address" is the internal IP address of the MPC-II card. Generally, it is the IP address in the private network and must be in the same network segment as "Control interface IP address" in Figure 3-8.

- "IP address for media port 1" and "IP address for media port 2" are the external IP addresses of the MPC-II card. Generally, they are the IP addresses in the public network.
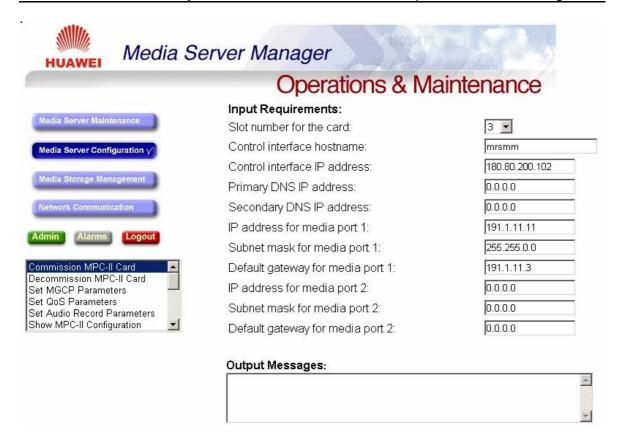
Figure 3-11 Configuring IP address of MPC-III card

As shown in Figure 3-11, the following parameters should be mentioned.

- "Control interface hostname" is the host name of the MPC-III card. It, together with the domain name of the MRS6000 configured in Figure 3-15, constitutes the message domain name (consistent with the domain name of the MRS configured at SoftX3000 side) of the MPC-III card in the MGCP. For example, if the host name of the MPC-III card is mrsmm, the domain name of the MRS6000 is huawei.com, the message domain name of the MPC-III card in the MGCP is mrsmm.huawei.com.

- "Control interface IP address" is the internal IP address of the MPC-III card. Generally, it is the IP address in the private network and must be in the same network segment as "Control interface IP address" in Figure 3-8.

- "IP address for media port 1" and "IP address for media port 2" are the external IP addresses of the MPC-III card. Generally, they are the IP addresses in the public network.

3.5.3 Configuring MGCP Parameters of MPC

1) Click [Set MGCP Parameters] on the [Media Server Manager] interface to enter the configuration interface for the MGCP. On the interface, set the IP addresses of

MPC-II card and MPC-III card (the IP addresses of the IFMI cards of SoftX3000) as shown in Figure 3-12 and Figure 3-13.

Figure 3-12 Configuring IP address of the MGC controlling MPC-II card

Figure 3-13 Configuring IP address of the MGC controlling MPC-III card

2)   Click [Put Card In Service] to active the MPC-II card and MPC-III card, as shown in Figure 3-14.

Figure 3-14 Activating MPC card

3)   Click [Network Communication/Set Node Domain Parameters] on the interface to
      set the domain name of the MRS6000, as shown in Figure 3-15.
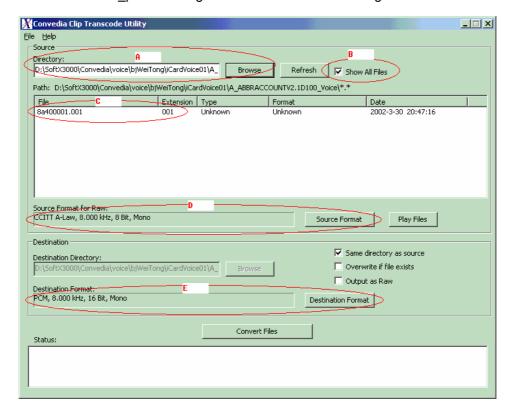
Figure 3-15 Configuring domain name of MRS6000

In Figure 3-15, [Domain name] is the domain name of the MRS6000. It, together with
the host names of the MPC cards configured in Figure 3-10 and Figure 3-11,
constitutes the message domain name (consistent with the domain name of the MRS
configured at SoftX3000 side) of the MPC card in the MGCP. For example, if the host
name of the MPC-II card is mrsvm, the domain name of the MRS6000 is huawei.com,
the message domain name of the MPC-II card in the MGCP is mrsvm.huawei.com.

3.5.4 Converting Formats of Original IN Voice Files (Optional)

If the SCP applies Huawei's TELLIN equipment, the software package of the IN services will contain the required original IN voice files. The file name format is XXXXXXXX.001, and the voice coding format is "CCITT A-Law", "8000 kHz", "8 bit" and "mono". However, because the voice files loaded to MRS6000 must be in G.729c format, it is required to convert the formats of the original IN voice files to the required formats on site following the steps below:

1) Contact the local office of Huawei Technologies to obtain the format conversion software Clip Transcode Utility.

2) Use the Clip Transcode Utility to convert the XXXXXXXX.001 files in the format of "CCITT A-Law", "8000 kHz", "8 bit" and "mono" into wav files in the format of "PCM", "8000 kHz", "16 bit" and "mono". The file after conversion is named as XXXXXXXX_pcm.wav. Figure 3-16 shows the converting method.

A: Source file path; B: Show all files; C: Files to be converted; D: Source file format; E: Destination file format.

Figure 3-16 Converting a source file

3) Follow the same method to convert the XXXXXXXX_pcm.wav files to the wav files in G.729c format. The file after conversion is named as XXXXXXXX_pcm_g729c.wav.

3.5.5 Editing XML Files and BAT Files (Optional)

I. Introduction

In normal cases, if MRS6000 is adopted for networking, Huawei will release the following two key files along with the SoftX3000 software package:

- One is the XML file named as SxAudioCfg.xml, used to describe voice file referencing relation between SoftX3000 and MRS6000.
- The other is the BAT file named as SxLoadClips.bat, used to describe the corresponding relation between "Clip ID", voice ID and language.

Generally, these two files can be used directly without any modification. However, in such special cases as playing customized voices and modifying the language bit parameters of IN voices, it is needed to edit these two files accordingly.

II. Voice file conferencing relation between SoftX3000 and MRS6000

As described in Chapter 6, "Configuring MRS Data" in *U-SYS SoftX3000 Operation Manual-Configuration Guide,* various voice files needed by MRS6000 are suffixed as ".wav". Refer to Figure 3-17.

CRO_TID_117_TONE_g729c.wav	CRO_TID_INCOMING_TOLL_TONE_g729c.wav
CRO_TID_ABSENT_TONE_g729c.wav	CRO_TID_LEAVE_MESSAGE_CANCEL_NOTIFICATION_TO_g729c.wav
CRO_TID_BILLING_TONE_g729c.wav	CRO_TID_MALICIOUS_CALL_SUCCESS_TONE_g729c.wav
CRO_TID_BUSY_TONE_g729c.wav	CRO_TID_MUSIC_g729c.wav
CRO_TID_CALL_BACK_TONE_g729c.wav	CRO_TID_NETWORK_CONGESTION_TONE_g729c.wav
CRO_TID_CALL_FORWARDING_RESTRICTION_TONE_g729c.wav	CRO_TID_NEW_SERVICE_CANCEL_TONE_g729c.wav
CRO_TID_CALL_RESTRICTION_TONE_g729c.wav	CRO_TID_NEW_SERVICE_FAIL_TONE_g729c.wav
CRO_TID_CALL_WAITING_TONE_g729c.wav	CRO_TID_NEW_SERVICE_REGISTER_TONE_g729c.wav
CRO_TID_CALLED_BILLING_TONE_g729c.wav	CRO_TID_NO_SUCH_NUMBER_TONE_g729c.wav
CRO_TID_CALLED_BUSY_TONE_g729c.wav	CRO_TID_NOT_DISTURB_TONE_g729c.wav
CRO_TID_CALLED_OUT_OF_SERVICE_TONE_g729c.wav	CRO_TID_NUMBER_CHANGED_TONE_g729c.wav
CRO_TID_CALLED_UNREACHABLE_TONE_g729c.wav	CRO_TID_OFF_HOOK_WARNING_TONE_g729c.wav
CRO_TID_CALLER_WAITING_TONE_g729c.wav	CRO_TID_RING_BACK_TONE_g729c.wav
CRO_TID_CALLIN_RESTRICTION_TONE_g729c.wav	CRO_TID_SECOND_DIAL_TONE_g729c.wav
CRO_TID_COMPUTER_ON_DUTY_TONE_g729c.wav	CRO_TID_SERVICE_NOT_PROVIDED_TONE_g729c.wav
CRO_TID_CONF_CALLING_TONE_g729c.wav	CRO_TID_SPECIAL_DIAL_TONE_g729c.wav
CRO_TID_DIAL_TONE_g729c.wav	CRO_TID_TEST_OVER_TONE_g729c.wav
CRO_TID_ERROR_NUMBER_TONE_g729c.wav	CRO_TID_WAKEUP_TONE_g729c.wav

Figure 3-17 Voice files used by MRS6000

These digital voice files are stored in the BAM hard disk, so it is possible to load them to the MPC of MRS6000 through TFTP, and then SoftX3000 will instruct MRS6000 to invoke them through MGCP. This invocation relation is codetermined by SoftX3000, the XML file and the voice loading relation, as shown in Table 3-5.

Table 3-5 Invocation relation between announcement operations and voice files

Defined by SoftX3000		Defined by the XML file		Defined by the voice loading relation
Tone ID	File Name	AudioSet setName	clipIndex (Clip ID)	Voice file name
TID_0X0001	1	HWF0010001	1	CRO_TID_117_TONE_g729 c.wav
TID_0X0004	4	HWF0010004	4	Cro_TID_WAKEUP_TONE_ g729c.wav
TID_0X000B	11	HWF001000B	11	CRO_TID_ERROR_NUMBE R_TONE_g729c.wav
TID_0X000C	12	HWF001000C	12	CRO_TID_NO_SUCH_NUM BER_TONE_g729c.wav
TID_0X002E	46	HWF001002E	46	CRO_TID_ABSENT_TONE_ g729c.wav

1) This invocation relation can be simply presented as: Tone ID→File Name→AudioSet setName→clipIndex (Clip ID)→Voice File Name.

2) SoftX3000 defines the corresponding relation between "Tone ID" and "File Name". For basic tones and IN service voices, this corresponding relation is defined by the software, so it cannot be configured. This corresponding relation between signal tones and supplementary service tones, is required to be configured manually. For example, the following commands must be executed for Table 3-5:

```
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0X0001, FILENAME=1;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0X0004, FILENAME=4;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x000B, FILENAME=11;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x000C, FILENAME=12;
ADD TONEID: EID="mrs102.huawei.com", TONEID=TID_0x002E, FILENAME=46;
```

3) When SoftX3000 sends an announcement operation to MRS6000 through MGCP, it will specify the voice ID (in such formats as "00000000", "HWF0010001", and "HW1A400001") and the language (in such formats as "chi", "eng", and "may") in the MGCP message. Voice IDs have a one-to-one corresponding relationship with the file names defined by SoftX3000. For example, in Table 3-5, "1" corresponds to HWF0010001, "4" corresponds to HWF0010004, and "11" corresponds to HWF001000B.

4) Edit the XML file according to the voice ID and the language specified in the MGCP message. This XML files defines the corresponding relation between "AudioSet setName", "LangMember lang" and "clipIndex". Here, "AudioSet setName" refers to the "File Name" defined by SoftX3000. For example, the following statements must be defined for Table 3-5:

```
<AudioSet setName="HWF0010001">
  <LangMember lang="chi"          clipIndex="1"/>
```

```
</AudioSet>
<AudioSet setName="HWF0010004">
 <LangMember lang="chi"            clipIndex="4"/>
</AudioSet>
<AudioSet setName="HWF001000B">
 <LangMember lang="chi"            clipIndex="11"/>
</AudioSet>
<AudioSet setName="HWF001000C">
 <LangMember lang="chi"            clipIndex="12"/>
</AudioSet>
<AudioSet setName="HWF001002E">
 <LangMember lang="chi"            clipIndex="46"/>
</AudioSet>
```

5) When loading voice files to MRS6000, it is needed to define the corresponding relation between "Clip ID" and voice file name either through the Web management interface of MRS6000 one by one or through the batch processing file. Here, "Clip ID" refers to the "clipIndex" defined in the XML file. Refer to the later sections for operation details.

III. Editing the XML file

●   Editing tool

The XML file is saved in text format. Such operations as modification, deletion, addition or saving can be performed in wordpad or WORD. If the system prompts whether to save the XML file in plain text, click <Yes>.

In view of security, it is recommended to back up the XML file before editing it.

●   Operation example (except variable voices)

When editing the XML file, do not modify the head, tail and other parts of the file except the following parts:

```
<AudioSet setName="HW1A400002">
 <LangMember lang="eng"            clipIndex="4002"/>
</AudioSet>
```

Here, "AudioSet setName" is the voice ID sent by SoftX3000 to MRS6000, also the "File Name" defined by SoftX3000. "LangMember lang" is the suffix of the specified language, where, "eng" stands for English and "chi" stands for Chinese and dialect. "clipIndex" is the voice file index saved in MRS6000, which must be corresponding to the "Clip ID" specified during actual loading.

📖 **Note:**

- The value range of "clipIndex" is between 0 and 49999. 0 to 1999 are for basic tones and supplementary service voices, 2000 to 39999 are for IN service voices, and 40000 to 49999 are for variable voices.
- When editing the XML file, "HW" can be added directly to the voice codes in "xxx service voice list" as "AudioSet setName".
- The letters in "AudioSet setName" are all capitalized.

IV. Editing the BAT file

- Editing tool

The BAT file is saved in text format. Such operations as modification, deletion, addition or saving can be performed in wordpad or WORD. If the system prompts whether to save the BAT file in plain text, click <Yes>.

In view of security, it is strongly recommended to back up the BAT file before editing it.

- Operation example

When editing the BAT file, do not modify the head, tail and other parts of the file except the following part:

```
perl loadclips.pl   %1   voice\\varible\\chi\\LC_zero_chi.wav   %2   45000
```

The above text can be divided into five parts:

- "perl loadclips.pl" is a fixed statement and it is prohibited from being modified.
- "%1" refers to the IP address of the TFTP server, which is temporarily specified through DOS command. It is the first parameter following the batch processing file name.
- "voice\\varible\\chi\\LC_zero_chi.wav" refers to the storage path and file name of the wav file in the PC hard disk. Note that child directories and parent directories must be separated by "\\".
- "%2" refers to the external IP address of the SCC of MRS6000, which is temporarily specified through DOS command. It is the second parameter following the batch processing file name.
- "45000" refers to the "Clip ID", which must be corresponding to the "clipIndex" defined in the XML file.

3.5.6 Loading Voice Files to MRS6000

I. Preparations

1) Obtain the following software or files from the website of CONVEDIA (http://www.convedia.com/files) or Huawei regional office:

- TFTP server software: TFTPServer1-1-980730.exe
- XML file: SxAudioCfg.xml
- BAT file: SxLoadBasic.bat

2) Unzip the file "loadclips_3.1.1.zip" under C:\ of the BAM hard disk. Then the system automatically creates two folders "C:\perl32" and "C:\ucd-snmp". Copy the above-mentioned XML file and BAT file to the folder "C:\ucd-snmp".

II. Starting TFTP server

1) Install TFTPServer1-1-980730.exe on the BAM, and then run Tftp.exe. The startup window is as shown in Figure 3-18.
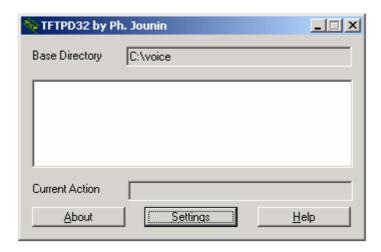
Figure 3-18 Specifying TFTP server root

2) Click <Settings> on Figure 3-18. The dialog box as shown in Figure 3-19 is displayed.

- Type the folder storing MRS6000 voice files (suffixed with ".wav") on the BAM in the box [Base Directory], for example, C:\voice\.
- Use the default values for other parameters.
- Finishing the setting, click <OK>.
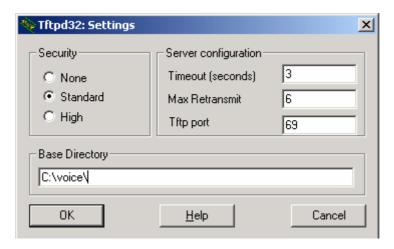
Figure 3-19 Setting base directory for the TFTP server

III. Logging in to Media Server Manager of MRS6000

1) Connect the PC and the SCC of MRS6000 to a LAN. Start IE browser on the PC and type http://external IP address of SCC in the address box.

2) Type the user name (admin) and the password (mrs6000) to log in to the Media Server Manager of MRS6000. Click <Media Storage Management> to open the [Media Server Management] window as shown in Figure 3-20.
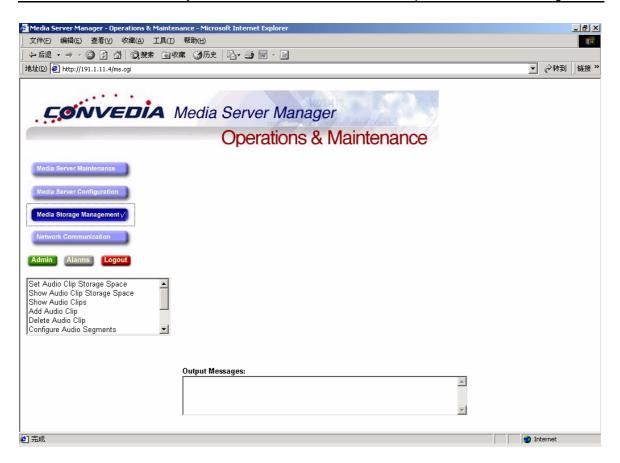
Figure 3-20 [Media Server Management] window

IV. Loading XML file

1) Select "Configure Audio Segments" in the list box at the bottom left corner of Figure 3-20. The window as shown in Figure 3-21 is displayed.
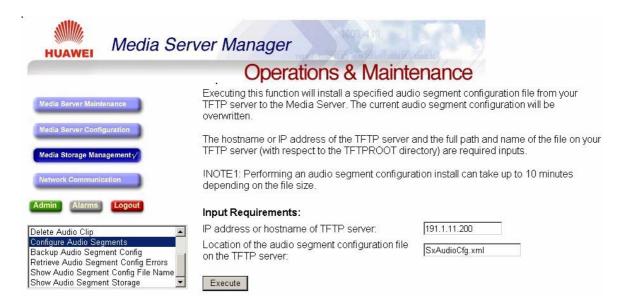
Figure 3-21 Setting TFTP information

2) Type the IP address of the TFTP server (for example, 191.1.11.200) and the name of the XML file on the TFTP server (for example, SxAudioCfg.xml).

3) If the TFTP server is ready, click <Execute>. Then MRS6000 downloads the XML file from the TFTP server.

 Note:

The version of the voice file index table should be consistent with that of MRS6000 and SoftX3000; otherwise, wrong announcements might be played.

V. Loading a voice file

1) Select "Add Audio Clip" in the list box on the bottom left corner of Figure 3-20. The window as shown in Figure 3-22 is displayed.

.
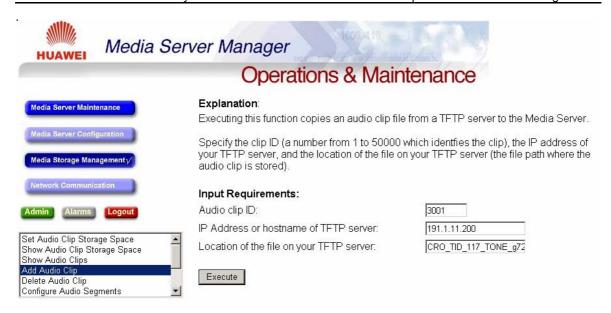
Figure 3-22 Loading a voice file

2)   Enter the clip ID (for example, 3001) of the voice file to be loaded, the IP address (for example, 191.1.11.200) of the TFTP server, and the voice file name (for example, CRO_TID_117_TONE_g729c.wav) on the TFTP server according to the mapping relation between the voice file and Clip ID.

3)   If the TFTP server is ready, click <Execute>. Then MRS6000 downloads the voice file from the TFTP server.

VI. Loading a batch of voice files

1) Enter the DOS system on the PC (it is BAM here) where the TFTP server is installed, and execute "CD C:\ucd-snmp" to enter the folder "C:\ucd-snmp".

2) Execute the file SxLoadClips.bat to load a batch of voice files to MRS6000. The Dos command should be in the format of "SxLoadClips (a blank space) IP address of TFTP server (a blank space) external IP address of the SCC", for example, sxloadclips 191.1.11.200 191.1.11.9. The loading process is as shown in Figure 3-23.

```
C:\WINNT\System32\cmd.exe                                          _ □ ×
Microsoft Windows 2000 [Version 5.00.2195]
(C) 版权所有 1985-2000 Microsoft Corp.

C:\>cd ucd-snmp

C:\UCD-SNMP>sxloadclip 191.1.11.200 191.1.11.9
'sxloadclip' 不是内部或外部命令，也不是可运行的程序
或批处理文件。

C:\UCD-SNMP>sxloadclips 191.1.11.200 191.1.11.9

C:\UCD-SNMP>rem History

C:\UCD-SNMP>rem

C:\UCD-SNMP>rem

C:\UCD-SNMP>rem

C:\UCD-SNMP>rem

C:\UCD-SNMP>rem
********Start Download Basic voice Tone to MRS************************
191.1.11.200 (voice\CRO_TID_117_TONE_g729c.wav) -> 191.1.11.9 (Clip 3001) ... O
K
```

Figure 3-23 Loading a batch of voice files

Chapter 4 Service Related Configurations

4.1 Configuring Centrex Service

4.1.1 Introduction

I. Typical networking model

A corporation applies to the carrier for the IP Centrex service, requiring to add all its ESL subscribers, SIP subscribers, H.323 subscribers, a U-Path device, and Open Eye devices into the Centrex group. The access networking model is illustrated in Figure 4-1.
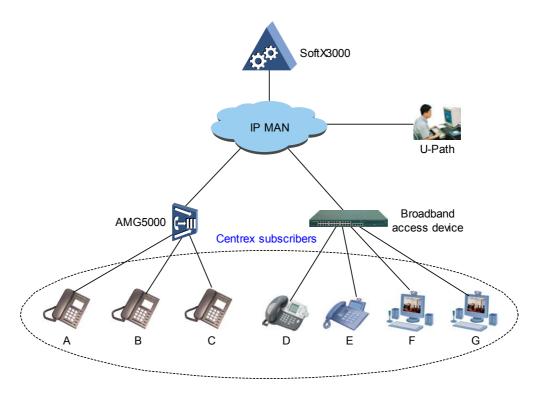
Figure 4-1 Access networking model of a corporation

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) All subscribers in the corporation are added into the Centrex group. The subscribers in the Centrex group can dial short numbers to call each other.

2) The calls made between Centrex subscribers are not charged.

3) The call-in rights, call-out rights, and supplementary service authorities of the Centrex subscribers can be managed through the U-Path.

4) The Centrex subscribers can directly dial special service prefixes, such as fire emergency prefix.

III. Planning basic data

Only basic data necessary for the configuration is described for simplification purposes. See Table 4-1.

Table 4-1 Planning basic data

Serial No.	Parameter	Value
1	Call source to which the Centrex subscribers belong	2
2	Local DN set to which the Centrex subscribers belong	0
3	Group number of the Centrex group	2
4	Centrex outgoing prefix	0
5	Access code to the U-Path (console)	9
6	Long numbers for the Centrex subscribers	3331000 – 3331999
7	Short numbers for the Centrex subscribers	2000 – 2999
8	Number of the U-Path	2
9	Long number assigned to the U-Path	3331999
10	Short number assigned to the U-Path	2999

Do not define the initial which is used by special services in your country as the Centrex outgoing prefix. For example, in China "1" is the initial used by the fire emergency service, ambulance emergency service, and other special services, and consequently "1" cannot be defined as the Centrex outgoing prefix.

4.1.2 Script

For Centrex services (including the IP supermarket service), if it is expected to print bills through the U-Path, the call tariff for Centrex subscribers has to be defined at the U-Path side. SoftX3000 is responsible for transferring the related Centrex bills only.

I. Configuring local office data

//Add a call source.

```
ADD CALLSRC: CSC=2, CSCNAME="Centrex", PRDN=1;
```

📖 **Note:**

Call source code 2 is applied to Centrex subscriber and the number of pre-received digits is 1. In this case, after a Centrex subscriber (only including ESL subscriber and V5 subscriber) dials Centrex group outgoing prefix, the subscriber can hear a secondary dial tone.

II. Configuring Centrex data (including U-Path)

//Add a Centrex group numbered 2. The Centrex group outgoing prefix is 9 and the capacity of subscribers is 1000.

```
ADD ICXGRP: CGN="Group", CXG=2, OGP=K'9, DOD2=YES, UCPC=1000;
```

//Add a Centrex intra-group prefix (short number). The intra-group prefix is 2. Both the minimum number length and the maximum number length are 4 digits.

```
ADD CXPFX: CXG=2, PFX=K'2, CSA=CIG, MINL=4, MAXL=4;
```

📖 **Note:**

Because the prefix "2" is used for intra-group calls made between the Centrex subscribers, the "service attribute" parameter in the command must be set to "intra-Centrex".

//Add Centrex intra-group prefixes (emergency outgoing prefixes). Both the minimum number length and the maximum number length are 3 digits.

```
ADD ICXPFX: CXG=2, PFX=K'110, CSA=EMCOUT, MINL=3, MAXL=3;
ADD ICXPFX: CXG=2, PFX=K'119, CSA=EMCOUT, MINL=3, MAXL=3;
ADD ICXPFX: CXG=2, PFX=K'120, CSA=EMCOUT, MINL=3, MAXL=3;
ADD ICXPFX: CXG=2, PFX=K'122, CSA=EMCOUT, MINL=3, MAXL=3;
```

📖 **Note:**

Because, for example, 110, 119, 120, and 122 are call prefixes to special services, the "service attribute" parameter in the command must be set to "out-group emergency call".

//Set the local IP address controlling the IP console. The IP address is that of the FE port of the IFMI board.

```
SET CONADDR: CONLAIP="191.169.150.30";
```

//Add a Simple Traversal of UDP through network address translators (STUN) local port (optionally configured). The module number of the IFMI is 132.

```
ADD STUNDISP: FMN=132;
```

📖 **Note:**

- The U-Path supporting STUN protocol accesses SoftX3000 through a network address translator (NAT), that is, the IP address of the U-Path is in a private network. In this case, to achieve the correct interconnection between SoftX3000 and the U-Path, an STUN local port must be added at the SoftX3000 side.
- By default all MSGI modules have STUN dispatch abilities. If it is modified, use the **SET DPA** command to configure it again.

//Set dispatch ability to enable the IFMI module to dispatch STUN protocol.

```
SET DPA: MN=132, DA=STUN-1;
```

//Add an IP console (that is, U-Path) numbered 2. The account name is group. The password is abc123. The Centrex short number is 2999. The call source code is 2.

```
ADD    CXCON:    D=K'3331999,    MN=22,    CONNO=2,    IP="191.169.150.61",
CODEC=G711_A-1&G711_U-1&G723_1-1&G729A-1, ACNT="group", PWD="abc123", CXG=2,
CXD=K'2999,   RCHS=33,   CSC=2,   AUT=NRM,   OCR=NTT-1&ITT-1&INTT-1&IITT-1,
COR=NTT-1&ITT-1&INTT-1&IITT-1;
```

📖 **Note:**

- If the U-Path uses a public dynamic IP address, you must set it to 255.255.255.255. In this case, SoftX3000 does not authenticate the IP address of the U-Path.
- If the U-Path uses a public static IP address, you can set it to any valid public IP address, for example, 191.169.150.99, or you can also set it to 255.255.255.255. If a valid static IP address is set, SoftX3000 will authenticate it.
- If the U-Path uses a private IP address, you must set it to 255.255.255.255; otherwise, the U-Path cannot be registered and SoftX3000 does not authenticate the IP address of the U-Path.

III. Configuring voice subscriber data

//Add an AMG adopting MGCP. The equipment ID is ShenZhen-AMG5000-01.com.

```
ADD MGW: EID="ShenZhen-AMG5000-01.com", GWTP=AG, MGWDESC="amg5000-01",
MGCMODULENO=22, PTYPE=MGCP, LA="191.169.150.30", RA1="211.169.150.62",
RP=2427, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1;
```

//Add 300 ESL subscribers (Centrex subscribers).

```
ADB   VSBR:   SD=K'3331000,   ED=K'3331299,   LP=0,    MN=22,    DID=ESL,
EID="ShenZhen-AMG5000-01.com", STID=0, CODEC=PCMA, RCHS=33, CSC=2, NS=CLIP-1,
CGF=YES, CXG=2, SCXD=K'2000, COR=ITT-1&IITT-1;
```

📖 Note:

- Because it is required to play a secondary dial tone to an ESL subscriber after the Centrex outgoing prefix is dialed, the "call source code" parameter here is set to "2". (The number of pre-received digits is 1.)
- To enable all call-in, call-out, and supplementary service authorities of Centrex subscribers on a U-Path, you must select all the options of console call-in authorities, console call-out authorities, and console supplementary service authorities for Centrex subscribers, and set Centrex subscribers and the U-Path managing them are subject to the same FCCU/FCSU (it is FCCU/FCSU 22 in the example). That is, the U-Path on module A cannot manage the authorities of Centrex subscribers on module B.

IV. Configuring multimedia subscriber data

//Add five multimedia devices adopting the session initiation protocol (SIP).

```
ADD MMTE: EID="3331900", MN=22, PT=SIP, IFMMN=132, PASS="3331900", AT=ABE;
ADD MMTE: EID="3331901", MN=22, PT=SIP, IFMMN=132, PASS="3331901", AT=ABE;
ADD MMTE: EID="3331902", MN=22, PT=SIP, IFMMN=132, PASS="3331902", AT=ABE;
ADD MMTE: EID="3331903", MN=22, PT=SIP, IFMMN=132, PASS="3331903", AT=ABE;
ADD MMTE: EID="3331904", MN=22, PT=SIP, IFMMN=132, PASS="3331904", AT=ABE;
```

//Add five SIP subscribers (Centrex subscribers).

```
ADD MSBR: D=K'3331900, LP=0, EID="3331900", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2900, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331901, LP=0, EID="3331901", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2901, COR=NTT-1&ITT-1;
```

```
ADD MSBR: D=K'3331902, LP=0, EID="3331902", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2902, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331903, LP=0, EID="3331903", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2903, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331904, LP=0, EID="3331904", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2904, COR=NTT-1&ITT-1;
```

Note:

Although an SIP subscriber cannot hear the secondary dial tone after dialing the outgoing prefix, set "call source code" to 2 for the convenience of management.

//Add five multimedia devices adopting the H.323 protocol.

```
ADD MMTE: EID="3331910", MN=22, PT=H323, DT=TERMINAL, PASS="123456", AT=ABE;
ADD MMTE: EID="3331911", MN=22, PT=H323, DT=TERMINAL, PASS="234567", AT=ABE;
ADD MMTE: EID="3331912", MN=22, PT=H323, DT=TERMINAL, PASS="345678", AT=ABE;
ADD MMTE: EID="3331913", MN=22, PT=H323, DT=TERMINAL, PASS="456789", AT=ABE;
ADD MMTE: EID="3331914", MN=22, PT=H323, DT=TERMINAL, PASS="567890", AT=ABE;
```

//Add five H.323 subscribers (Centrex subscribers).

```
ADD MSBR: D=K'3331910, LP=0, EID="3331910", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2910, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331911, LP=0, EID="3331911", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2911, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331912, LP=0, EID="3331912", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2912, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331913, LP=0, EID="3331913", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2913, COR=NTT-1&ITT-1;
ADD MSBR: D=K'3331914, LP=0, EID="3331914", RCHS=33, CSC=2, NS=CLIP-1, CGF=YES,
CXG=2, CXD=K'2914, COR=NTT-1&ITT-1;
```

Note:

Although an H.323 subscriber cannot hear the secondary dial tone after dialing the outgoing prefix, set "call source code" to 2 for the convenience of management.

V. Configuring number analysis data

//Add a call prefix.

```
ADD CNACLD: PFX=K'3331, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_3331";
```

4.1.3 Commissioning Guideline

I. Preparations

To commission Centrex services, make sure that the various media gateways, multimedia devices, and the U-Path have registered with SoftX3000. For details about the commissioning steps, refer to Chapter 1, "Subscriber Access Networking", in this manual.

II. Testing service by dialing short number

Dial an intra-group short number, for example, 2902, on a phone set in the Centrex group. Normally, the ringing tone should be immediately played to the called subscriber. After the callee hooks off, the caller and the callee can start a conversation. If the caller is notified of a wrong number after the caller dials, it indicates that the intra-group call prefix is not defined correctly. Use the **LST CXPFX** command to check whether the call prefix is set to "2" and whether the service attribute is set to "intra-Centrex".

III. Testing service by dialing outgoing prefix

1) A secondary dial tone is not played to SIP subscriber or U-Path after the outgoing prefix, "0", is dialed.
2) A secondary dial tone is immediately played to SIP subscriber, H.323 subscriber, OpenEye, and U-Path after the outgoing prefix, "0", is dialed, indicating the subscriber can go on dialing. If the caller does not hear the secondary dial tone, use the **LST VSBR** command to check whether the call source code for Centrex subscribers is set to "1" (defined in this example) and then use the **LST CALLSRC** command to check whether the number of pre-receive digits is set to "1".

IV. Testing service by dialing special service prefix

Dial a special service prefix, for example, the prefix to the fire emergency service, on a phone set in the Centrex group. Normally, the callee should be connected. If the caller is notified of a wrong number after the caller dials, use the **LST CXPFX** command to check whether the service attribute for various special service prefixes is set to "out-group emergency call".

4.2 Configuring Wide Area Centrex Service (Number Change Mode)

4.2.1 Introduction

I. Typical networking model

A company has registered the wide area Centrex (WAC) service in areas A and B, and the Centrex service in areas A and B are provided by two offices. Suppose that the short numbers and long numbers for the company in office A (SoftX3000) are planned as 3XXX and 8783XXX respectively; the short numbers and long numbers for the company in office B are planned as 5XXX and 8975XXX respectively. A typical networking model is illustrated in Figure 4-2.
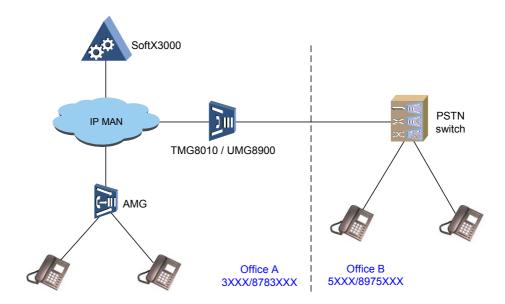
Figure 4-2 Typical networking model for WAC of a company

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1)   All subscribers of the company in area A are Centrex subscribers, and they can call each other by dialing 3XXX without charge.

2)   All subscribers of the company in area B are Centrex subscribers, and the subscribers in area A can call those in area B by dialing 5XXX. The calls are charged as local calls.

3) The console of the company is in office B. Centrex subscribers in area A can directly call the console by dialing 9.

III. Planning of basic data

For simplicity, only necessary basic data are listed in Table 4-2.

Table 4-2 Planning of basic data

Serial No.	Parameter	Value
1	Call source of Centrex subscribers in area A	5
2	Local DN set of Centrex subscribers in area A	0
3	Number of Centrex group in area A	5
4	Outgoing prefix of Centrex group in area A	0
5	Long numbers for Centrex subscribers in area A	8783000－8783999
6	Short numbers for Centrex subscribers in area A	3000－3999
7	Number dialed by Centrex subscribers in area A to access the console	9
7	Long numbers of WAC subscribers in area B	8975000－8975999
8	Short numbers of WAC subscribers in area B	5000－5999
9	Long number of the console subscriber in area B	8975999

4.2.2 Script

I. Configuring local data

//Add number change data. Set number change indices to 10 and 20 respectively.

```
ADD DNC: DCX=10, DCT=INS, ND=K'897;
ADD DNC: DCX=20, DCT=MOD, DCL=1, ND=K'8975999;
```

 Note:

- The first command enables the system to insert the number 897 before the original number. When a Centrex subscriber in office A dials 5XXX, the system will automatically change the number to 8975XXX.
- The second command enables the system to change the first digit of the original number to 8975999. When a Centrex subscriber in office A dials 9, the system will automatically change the number to 8975999, the long number of the console.

//Add a call source.

```
ADD CALLSRC: CSC=5, CSCNAME="Centrex", PRDN=1;
```

 Note:

Call source code 5 is used for Centrex subscribers, and the number of pre-received digits is 1. In this case, a Centrex subscriber (only referring to ESL subscriber or V5 subscriber) will hear the secondary dial tone after dialing the outgoing prefix.

II. Configuring Centrex data

//Add a Centrex group. Set Centrex group number to 5, outgoing prefix to 0, and subscriber capacity to 1000.

```
ADD CXGRP: CGN="A group", CXG=5, OGP=K'0, DOD2=YES, UCPC=1000;
```

//Add an intra-Centrex prefix (short number) 3. Set both the maximum and minimum number lengths to 4.

```
ADD ICXPFX: CXG=5, PFX=K'3, CSA=CIG, MINL=4, MAXL=4;
```

 Note:

Because the prefix "3" is used for calls between intra-Centrex subscribers, the parameter "Service attribute" in the command must be set to "Intra-Centrex".

//Add a WAC prefix (short number) 5. Set both the maximum and minimum number lengths to 4, and the number change index to 10.

```
ADD ICXPFX: CXG=5, PFX=K'5, CSA=CWA, MINL=4, MAXL=4, DCX=10;
```

Note:

Because the prefix "5" is used for calls between WAC subscribers, the parameter "Service attribute" in the command must be set to "Centrex WAN access code", and "number change index" must be set to "10".

//Add a WAC intra-group prefix (console access code). Set Centrex call prefix to 9. Set both the maximum and minimum number lengths to 1, and the number change index to 20.

```
ADD ICXPFX: CXG=5, PFX=K'9, CSA=CWA, MINL=1, MAXL=1, DCX=20;
```

Note:

"Service attribute" must be set to "Centrex WAN access code" and "number change index" must be set to "20", because the call prefix 9 is mainly used by WAC subscribers to call the console.

III. Configuring voice subscriber data

//Add an MGCP-based AMG. Set equipment ID to ShenZhen-AMG5000-05.com.

```
ADD  MGW:  EID="ShenZhen-AMG5000-05.com",  GWTP=AG,  MGWDESC="amg5000-05",
MGCMODULENO=22,  PTYPE=MGCP,  LA="191.169.150.30",  RA1="211.169.150.65",
RP=2427,   LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,   HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1;
```

//Add a batch of 300 ESL subscribers (Centrex subscribers).

```
ADB   VSBR:   SD=K'8783000,   ED=K'8783299,   LP=0,   MN=22,   DID=ESL,
EID="ShenZhen-AMG5000-05.com", STID=0, CODEC=PCMA, RCHS=33, CSC=5, NS=CLIP-1,
CGF=YES, CXG=5, SCXD=K'3000, COR=ITT-1&IITT-1;
```

 Note:

- Because ESL subscribers need to hear the secondary dial tone after dialing the outgoing prefix, the parameter "call source code" must be set to 5 (the number of pre-received digits is 1).
- If the CID function is enabled for ESL subscribers, the parameter "supplementary service" must be set to "CLIP".

IV. Configuring number analysis data

//Add an intra-Centrex prefix 8783. Set service attribute to "Intra-office".

```
ADD    CNACLD:    PFX=K'8783,    CSA=LCO,    MINL=7,    MAXL=7,    CHSC=0,
SDESCRIPTION="Office_8783";
```

//Add a WAC prefix 8975. Set service attribute to "Local".

```
ADD    CNACLD:    PFX=K'8975,    CSA=LC,    RSC=89,    MINL=7,    MAXL=7,    CHSC=0,
SDESCRIPTION="Office_8975";
```

4.2.3 Commissioning Guideline

I. Preparations

Before testing the Centrex service, make sure that the MG, multimedia device, and U-Path are registered successfully at the SoftX3000. Refer to Chapter 1, "Subscriber Access Networking" for details.

II. Testing service by dialing Centrex short number

Dial the short number (for example, 3902) of an intra-Centrex subscriber on a Centrex phone set. In normal cases, the callee should hear the ringing tone immediately, and both parties can talk after the callee picks up the phone. If the system prompts wrong number after the caller dials the number, it indicates that the intra-Centrex prefix is not defined correctly, and use the command **LST ICXPFX** to check if the out-group prefix is "3" and service attribute is "Intra-Centrex".

III. Testing service by dialing WAC short number

Dial the short number (for example, 5112) of a WAC subscriber on a Centrex phone set. In normal cases, the callee should hear the ringing tone immediately, and both parties can talk after the callee picks up the phone. If the system prompts wrong number after the caller dials the number, use the commands **LST ICXPFX**, **LST DNC**, and **LST**

CNACLD to check if the intra-Centrex prefix attribute, number change mode, and route selection code are configured correctly.

4.3 Configuring Wide Area Centrex Service (Number Translation Mode)

4.3.1 Introduction

I. Typical networking model

The headquarters of a company is in city A, and a branch of the company is in city B. The company has registered the WAC service to a carrier in city A. The Centrex service in the headquarters is provided by office A. The short numbers and long numbers for the headquarters are planned as 3XXX and 8783XXX respectively. The service in the branch is provided by multiple offices because the office buildings of the branch are scattered. The short numbers for the branch are planned as 5XXX. The long numbers for the branch are irregular. A typical networking model is illustrated in Figure 4-3.
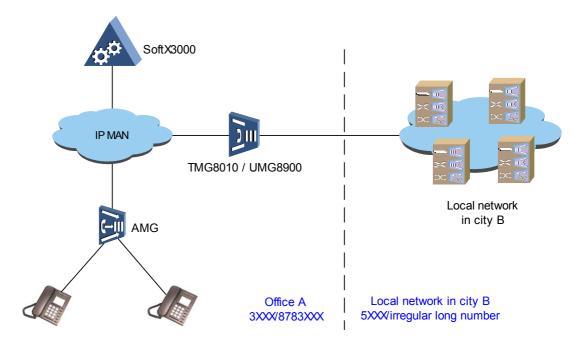
Figure 4-3 Typical networking model for WAC of a company

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- All subscribers of the company in city A are Centrex subscribers, and they can call each other by dialing 3XXX without charge.
- All subscribers of the company in city B are Centrex subscribers, and the subscribers in city A can call those in city B by dialing 5XXX. The calls are charged as toll calls.
- A WAC subscriber in city B calls a WAC subscriber in city A. The caller number displayed on the phone of the subscriber in city A is the short number of the caller, 5XXX.

III. Planning of basic data

For simplicity, only necessary basic data are listed in Table 4-3.

Table 4-3 Planning of basic data

Serial No.	Parameter	Value
1	Call source of Centrex subscribers in city A	6
2	Local DN set of Centrex subscribers in city A	0
3	Number of Centrex group in city A	6
4	Outgoing prefix of Centrex group in city A	0
5	Long numbers for Centrex subscribers in city A	8793000 – 8793999
6	Short numbers for Centrex subscribers in city A	3000 – 3999
7	Area code of city B	020
8	Long numbers of WAC subscribers in X district of city B	51230000 – 51230019
9	Short numbers of WAC subscribers in X district of city B	5000 – 5019
10	Long numbers of WAC subscribers in Y district of city B	66860030 – 66860059
11	Short numbers of WAC subscribers in Y district of city B	5030 – 5059
12	Long numbers of WAC subscribers in Z district of city B	89120080 – 89120099
13	Short numbers of WAC subscribers in Z district of city B	5080 – 5099

4.3.2 Script

I. Configuring local data

//Add a call source.

```
ADD CALLSRC: CSC=6, CSCNAME="Centrex", PRDN=1;
```

📕 **Note:**

Call source code 6 is used for Centrex subscribers, and the number of pre-received digits is 1. In this case, a Centrex subscriber (only referring to ESL subscriber or V5 subscriber) will hear the secondary dial tone after dialing the outgoing prefix.

II. Configuring Centrex data

//Add a Centrex group. Set Centrex group number to 6, outgoing prefix to 9, and subscriber capacity to 500.

```
ADD CXGRP: CGN="B Centrex", CXG=6, OGP=K'9, DOD2=YES, UCPC=500;
```

//Add an intra-Centrex prefix (short number) 3. Set both the maximum and minimum number lengths to 4.

```
ADD ICXPFX: CXG=16, PFX=K'3, CSA=CIG, MINL=4, MAXL=4;
```

📕 **Note:**

Because the prefix "3" is used for calls between intra-Centrex subscribers, the parameter "Service attribute" in the command must be set to "Intra-Centrex".

//Add a WAC prefix (short number) 5. Set both the maximum and minimum number lengths to 4. Do not specify the number change index parameter.

```
ADD ICXPFX: CXG=6, PFX=K'5, CSA=CWA, MINL=4, MAXL=4;
```

📕 **Note:**

Because the prefix "5" is used for calls between WAC subscribers, the parameter "Service attribute" in the command must be set to "Centrex WAN access code".

III. Configuring voice subscriber data

//Add an MGCP-based AMG. Set equipment ID to ShenZhen-AMG5000-06.com.

```
ADD  MGW:  EID="ShenZhen-AMG5000-06.com",  GWTP=AG,  MGWDESC="amg5000-01",
MGCMODULENO=22,  PTYPE=MGCP,  LA="191.169.150.30",  RA1="211.169.150.66",
RP=2427,   LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,   HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1;
```

//Add a batch of 300 ESL subscribers (Centrex subscribers).

```
ADB  VSBR:  SD=K'8793000,  ED=K'8793299,  LP=0,  MN=22,  DID=ESL,
EID="ShenZhen-AMG5000-06.com", STID=0, CODEC=PCMA, RCHS=33, CSC=6, NS=CLIP-1,
CGF=YES, CXG=6, SCXD=K'3000, COR=ITT-1&IITT-1;
```

📖 **Note:**

- Because ESL subscribers need to hear the secondary dial tone after dialing the outgoing prefix, the parameter "call source code" must be set to 1 (the number of pre-received digits is 1).
- If the CID function is enabled for ESL subscribers, the parameter "supplementary service" must be set to "CLIP".

//Add an intra-Centrex prefix 8793. Set service attribute to "Intra-office".

```
ADD  CNACLD:  PFX=K'8793,  CSA=LCO,  MINL=7,  MAXL=7,  CHSC=0,
SDESCRIPTION="Office_8793";
```

IV. Configuring WAC subscriber data

//Add a batch of wide area Centrex subscribers. Set start subscriber number to 02051230000, end subscriber number to 02051230019, Centrex group number to 16, and start Centrex short number to 5000.

```
ADB WACSBR: SD=K'02051230000, ED=K'02051230019, CXG=6, CSC=0, SCXD=K'5000;
```

  📖 **Note:**

If the office to which a WAC subscriber belongs is not in the same local area network as the local office, the subscriber specified here should contain the area code of the former normally.

//Add a batch of wide area Centrex subscribers. Set start subscriber number to 02066860030, end subscriber number to 02066860059, Centrex group number to 6, and start Centrex short number to 5030.

```
ADB WACSBR: SD=K'02066860030, ED=K'02066860059, CXG=16, CSC=0, SCXD=K'5030;
```

//Add a batch of wide area Centrex subscribers. Set start subscriber number to 02089120080, end subscriber number to 02089120099, Centrex group number to 6, and start Centrex short number to 5080.

```
ADB WACSBR: SD=K'02089120080, ED=K'02089120099, CXG=16, CSC=0, SCXD=K'5080;
```

V. Configuring caller number discrimination data

//Add a batch of caller number discrimination groups. Set discrimination group number to 65534, start caller number to 02051230000, end caller number to 02051230019, address nature to National number, function code to Judge caller type, and WAC group number to 6.

```
ADB CLRDSN: DSP=65534, SCLI=K'02051230000, ECLI=K'02051230019, DAI=NDN,
FUNC=CLRTYP, WACGRP=6, USRTYP=WACUSR;
```

  📖 **Note:**

When a WAC subscriber calls a Centrex subscriber in the local office through an incoming trunk, execute the command **ADD CLRDSN** to discriminate the caller number in the incoming call (set "function code" to "Judge caller type"). In this way, the short number of the WAC subscriber is displayed on the phone of the callee.

//Add a batch of caller number discrimination groups. Set discrimination group number to 65534, start caller number to 02066860030, end caller number to 02066860059, address nature to National number, function code to Judge caller type, and WAC group number to 6.

```
ADB  CLRDSN:  DSP=65534,  SCLI=K'02066860030,  ECLI=K'02066860059,  DAI=NDN,
FUNC=CLRTYP, WACGRP=16, USRTYP=WACUSR;
```

//Add a batch of caller number discrimination groups. Set discrimination group number
to 65534, start caller number to 02089120080, end caller number to 02089120099,
address nature to National number, function code to Judge caller type, and WAC group
number to 16.

```
ADB  CLRDSN:  DSP=65534,  SCLI=K'02089120080,  ECLI=K'02089120099,  DAI=NDN,
FUNC=CLRTYP, WACGRP=16, USRTYP=WACUSR;
```

```
//Modify No. 7 trunk groups. Set both "Can request caller number" and "Whether
request caller number" to "True".
MOD N7TG: TG=31, NIF=YES, ISCLR=YES;
MOD N7TG: TG=41, NIF=YES, ISCLR=YES;
MOD N7TG: TG=51, NIF=YES, ISCLR=YES;
```

//Add trunk discrimination groups. Set discrimination group number to 65534 (wildcard).

```
ADD TGDSG: TG=31, DSG=65534;
ADD TGDSG: TG=41, DSG=65534;
ADD TGDSG: TG=51, DSG=65534;
```

📖 **Note:**

● The caller number function is only valid for incoming trunk groups or bi-directional
  trunk groups. If you enter the number of an outgoing trunk group, errors will occur.
● Before using the caller number discrimination function of a trunk group, you must
  use the commands such as **MOD N7TG** and **MOD N1TG** to set both "Can request
  caller number" and "Whether request caller number" to "True". Otherwise, errors will
  occur.
●

4.3.3 Commissioning Guideline

I. Preparations

Before testing the Centrex service, make sure that the MG, multimedia device, and U-Path are registered successfully at the SoftX3000. Refer to Chapter 1, "Subscriber Access Networking" for details.

II. Testing service by dialing Centrex short number

Dial the short number (for example, 3902) of an intra-Centrex subscriber on a Centrex phone set. In normal cases, the callee should hear the ringing tone immediately, and both parties can talk after the callee picks up the phone. If the system prompts wrong number after the caller dials the number, it indicates that the intra-Centrex prefix is not defined correctly, and use the command **LST ICXPFX** to check if the out-group prefix is "3" and service attribute is "Intra-Centrex".

III. Testing service by dialing WAC short number

Dial the short number (for example, 5112) of a WAC subscriber on a Centrex phone set. In normal cases, the callee should hear the ringing tone immediately, and both parties can talk after the callee picks up the phone. If the system prompts wrong number after the caller dials the number, use the commands such as **LST ICXPFX** and **LST WACSBR** to check if the intra-Centrex prefix attribute and the long number and short number of the WAC subscriber are configured correctly.

IV. Testing the display of WAC short number

Dial the long number (or short number, set by the office in city B) of a Centrex subscriber in city A on the phone of any WAC subscriber in city B. In normal cases, the callee should hear the ringing tone immediately, and the short number of the caller should be displayed on the callee's phone. If the long number is displayed, use the command **LST CLRDSN** to check if the caller number discrimination data of the WAC subscriber is configured in the local office, and the function code parameter is set to "judge caller type".

4.4 Configuring IP Supermarket Service

4.4.1 Introduction

I. Service description

IP supermarket refers to the IP toll call service deployed by telecom carrier at telephone business outlets. SoftX3000 provides the IP supermarket function through IP Centrex. A U-Path (IP console) provides call management and billing functions at the IP supermarket sites.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) An IP supermarket outlet is an independent Centrex group. All the subscribers in the Centrex group are managed by the U-Path in the same group.

2) The dialing mode of Centrex subscribers is the same as that of ordinary subscribers, that is, Centrex subscribers do not dial the outgoing prefix when originating outgoing calls.

3) The call-in rights, call-out rights, and supplementary service authorities of the Centrex subscribers can be managed and controlled through the U-Path.

4) When a Centrex subscriber ends a call, the charging bill can be immediately queried and printed on the U-Path.

4.4.2 Script

For Centrex services (including the IP supermarket service), if it is expected to print bills through the U-Path, the call tariff for Centrex subscribers has to be defined at the U-Path side. SoftX3000 is responsible for transferring the related Centrex bills only.

I. Configuring local office data

//Add number change. The number change index is 3.

```
ADD DNC: DCX=3, DCT=INS, ND=K'9;
```

 Note:

The command means to add 9, which is the Centrex outgoing prefix, before the original number.

//Add a call source. Set "call source code" to "3", "number preparation" to "true", and "all number change index" to "3".

```
ADD CALLSRC: CSC=3, CSCNAME="IP Market", PRDN=3, DCF=YES, DCX=3;
```

📖 **Note:**

- It is recommended to define a unique call source for all Centrex subscribers using the IP supermarket service for management and control purposes.
- Centrex subscribers in an IP supermarket outlet only use outgoing services and do not make intra-group calls. To meet their requirement for not dialing the Centrex outgoing prefix when making calls, you can set the number preparation function of the call source to automatically add the Centrex outgoing prefix, 9 in this example, before any called number dialed by a Centrex subscriber.
- A secondary dial tone is unnecessarily played to Centrex subscribers. Therefore, the number of pre-received digits of the call source is set to 3 to reduce the load of the SoftX3000 main processor.

II. Configuring Centrex data (including U-Path)

//Add a Centrex group numbered 3. The Centrex group outgoing prefix is 9. A secondary dial tone is not played. The capacity of subscribers is 50.

```
ADD CXGRP: CGN="IP Market", CXG=3, OGP=K'9, DOD2=NO, UCPC=50;
```

//Modify the attributes of the Centrex group numbered 3.

```
MOD CXGRP: CXG=3, BSCF=DTM, IMF=YES;
```

📖 **Note:**

- The "send ticket to console" parameter in the command is set to "detailed ticket and meter table" so that SoftX3000 can send Centrex subscribers' bills to the U-Path in real time.
- The "IP market flag" in the command must be set to YES for the purpose of achieving the IP supermarket function.
- When SoftX3000 acts as an end office and its toll calls are charged by the toll office in a centralized way, the toll calls of local office subscribers cannot be set to "not charged". Otherwise, SoftX3000 neither generates toll bills nor sends any bills to the U-Path.

//Add a Centrex intra-group prefix (short number). The intra-group prefix is 5. Both the minimum number length and the maximum number length are 4 digits.

```
ADD ICXPFX: CXG=3, PFX=K'5, CSA=CIG, MINL=4, MAXL=4;
```

 Note:

Because the system implements the number preparation function (automatically adding the Centrex outgoing prefix 9 before the dialed number) on the call source to which Centrex subscribers belong, a call made between Centrex subscribers is connected only by dialing the long number of the callee.

//Set the local IP address controlling the IP console. The IP address is that of the FE port of the IFMI board.

```
SET CONADDR: CONLAIP="191.169.150.30";
```

//Add a Simple Traversal of UDP Through network address translators (STUN) local port (optionally configured). The module number of the IFMI is 132.

```
ADD STUNDISP: FMN=132;
```

 Note:

- The U-Path supporting STUN protocol accesses SoftX3000 through an NAT, that is, the IP address of the U-Path is in a private network. In this case, to achieve the correct interconnection between SoftX3000 and the U-Path, an STUN local port must be added at the SoftX3000 side.
- By default all MSGI modules have STUN dispatch abilities. If it is modified, use the **SET DPA** command to configure it again.

//Set dispatch ability to enable the IFMI module to dispatch STUN protocol.

```
SET DPA: MN=132, DA=STUN-1;
```

//Add an IP console (that is, U-Path) numbered 3. The IP address is 211.169.150.63. The account name is operator. The password is aaabbb. The Centrex short number is 5112. The call source code is 3.

```
ADD   CXCON:   D=K'8780112,   MN=22,   CONNO=3,   IP="211.169.150.63",
CODEC=G711_A-1&G711_U-1&G723_1-1&G729A-1,  ACNT="operater",  PWD="aaabbb",
```

```
CXG=3, CXD=K'5112, RCHS=87, CSC=3, AUT=NRM, OCR=NTT-1&ITT-1&INTT-1&IITT-1,
COR=NTT-1&ITT-1&INTT-1&IITT-1;
```

 Note:

- If the U-Path uses a public dynamic IP address, you must set it to 255.255.255.255. In this case, SoftX3000 does not authenticate the IP address of the U-Path.
- If the U-Path uses a public static IP address, you can set it to any valid public IP address, for example, 191.169.150.99, or you can also set it to 255.255.255.255. If a valid static IP address is set, SoftX3000 will authenticate it.
- If the U-Path uses a private IP address, you must set it to 255.255.255.255; otherwise, the U-Path cannot be registered and SoftX3000 does not authenticate the IP address of the U-Path.

III. Configuring voice subscriber data

//Add an IAD adopting MGCP. The equipment ID is shenzhen-iad132-02.com.

```
ADD  MGW:  EID="shenzhen-iad132-03.com",  GWTP=IAD,  MGWDESC="iad132-03",
MGCMODULENO=22,   PTYPE=MGCP,   LA="191.169.150.30",   RA1="211.169.150.64",
RP=2427,      LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1,      HAIRPIN=NS,
UCATT=NOFX-0&NOM-0;
```

//Add 16 ESL subscribers (Centrex subscribers).

```
ADB   VSBR:   SD=K'8780200,   ED=K'8780215,   LP=0,    MN=22,    DID=ESL,
EID="shenzhen-iad132-03.com", STID=0, CODEC=PCMA, RCHS=87, CSC=2, NS=CLIP-1,
CGF=YES, CXG=3, SCXD=K'5200, CHT=IMP, COR=ITT-1&IITT-1;
```

📖 **Note:**

- To manage all call-in rights, call-out rights, and supplementary service rights through the U-Path, select all the options in the parameters "console call in right", "console call out right", and "console supplementary service". (Pay attention to the default values.) In addition, configure the Centrex subscribers and the U-Path to be in the same FCCU/FCSU module (which is module number 22 in this example). In other words, the U-Path in module A cannot manage the call rights and supplementary service rights of the Centrex subscribers in module B.
- The charging class of Centrex subscribers must be set to "immediately sending to printer" so that call bills can be immediately queried and printed on the U-Path after Centrex subscribers end calls.
- At the U-Path side, the "receiving immediate bill" option on the bill management menu must be selected so that the U-Path can receive the immediate bills from SoftX3000.

4.4.3 Commissioning Guideline

I. Preparations

Refer to 4.1 Configuring Centrex Service in this chapter to ensure the basic Centrex services.

II. Checking whether Centrex subscribers' bills can be immediately sent to the U-Path

Normally SoftX3000 immediately sends the generated bill to the U-Path whenever a Centrex subscriber ends a call. Real-time charging is performed at the U-Path side. Centrex subscribers' bills can be viewed, queried, and printed through U-Path operation interfaces. If Centrex subscribers' bills cannot be immediately sent to the U-Path, do the following:
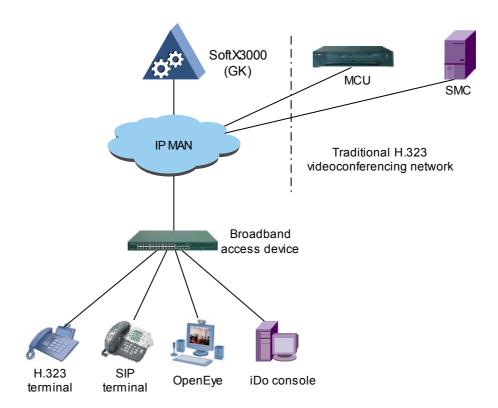
1) Use the **LST CXGRP** command to check whether the "IP market flag" of the Centrex group (numbered 2 in this example) to which the IP supermarket outlet belongs is set to "YES" and whether the "send ticket to console" parameter is set to "detailed ticket and meter table".

2) Use the **LST VSBR** command to check whether the "charging category" parameter is set to "immediately sending to printer".

3) Check whether system settings and parameter settings are configured correctly at the U-Path side if no data configuration errors are found at SoftX3000 side.

4.5 Configuring Videoconferencing Service

4.5.1 Introduction

I. Typical networking model

When acting as an H.323 GateKeeper (GK), SoftX3000 supports the videoconferencing service between multimedia devices such as H.323 video terminals, SIP video terminals, and OpenEye devices. Through the H.323 protocol, SoftX3000 is interconnected with multipoint control unit (MCU), service management center (SMC), and iDo conference console in the traditional H.323 videoconferencing network. A typical networking model is illustrated in Figure 4-4.

Figure 4-4 Typical networking model for SoftX3000 interworking with traditional H.323 videoconferencing network

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Conference presider can hold a videoconference through the iDo console.
2) Videoconference is charged on the basis of call prefix.

III. Interconnection parameters

Before configuring data at the SoftX3000 side, make sure that the following interconnection parameters have been negotiated with the MCU, SMU, and iDo console in the H.323 videoconferencing network, as shown in Table 4-4.

Table 4-4 Interconnection parameters between SoftX3000 and H.323 videoconferencing network

Serial No.	Parameter	Value
1	IP address of SoftX3000	191.169.150.30/255.255.0.0
2	Alias of SoftX3000	SoftX3000
3	IP address of MCU	191.169.150.41/255.255.0.0
4	IP address of SMC	191.169.150.42/255.255.0.0
5	Port number of SMC	7000
6	Port number for originating call interception	700
7	Port number of iDo	10000
8	Special service number for videoconferencing service	168

4.5.2 Script

I. Configuring H.323 data

//Add an H.323 system named "SoftX3000".

```
ADD H323SYS: SYSNM="SoftX3000";
```

 Note:

System name is the alias of SoftX3000 in the H.323 network. It must be set correctly, or SoftX3000 cannot interwork with GK, GW or MCU in the H.323 network.

//Add H.323 application layer. The number of TCP port numbers is 2000.

```
ADD H323APP: MN=211, IPDMN=132, MTYP=RCAPP, CALLMINPRT=6000, CALLMAXPRT=8000;
```

📖 **Note:**

- Only one MSGI is configured in SoftX3000, so the parameter "MSG module type" in the command must be set to "RAS & CALL application".
- For V300R003 or later versions of SoftX3000, you cannot configure the data on both the BAM and the host by executing the command **ADD H323APP**. After adding H323 application information by using the command, you must reset related MSGI module to complete the configuration.

II. Configuring videoconferencing service

//Add MCU configuration. The MCU index is 0. The equipment ID is mcu_0. The IP address of the MCU is 191.169.150.41. The call source code is 0.

```
ADD MCUCNF: MCUINDEX=0, EID="mcu_0", CCMID=22, MCUIP="191.169.150.41", CSC=0;
```

//Add iDo and SMC. The IP address of the SMC is 191.169.150.42. The special service code is 168.

```
ADD IDOSMC: MN=211, SMCIP="191.169.150.42", TCPSMC=65500, SSC=168;
```

📖 **Note:**

- It is recommended to use the default values for port numbers in the command if it is not for a specific purpose.
- The TCP port number connected to the SMC is defined at the SoftX3000 side. The value range is 1 to 65535, but it cannot conflict with the well-known port numbers for the various protocols or the port numbers that have been allocated in the database. For example, the TCP port number connected to the SMC can be set to 65500.

III. Configuring number analysis data

//Add the outgoing call prefix for the videoconferencing service. The call prefix is 168. The charging selection code is 0.

```
ADD CNACLD: PFX=K'168, CSA=MCU, MINL=3, MAXL=3, CHSC=0, SDESCRIPTION="Video
Service";
```

> 📖 **Note:**
>
> The special service code is dialed when an H.323 terminal is added into a conference by terminal dial-up mode. In the command, the "service attribute" parameter must be set to "MCU".

//Add a prefix to call ordinary multimedia subscriber.

```
ADD CNACLD: PFX=K'878, MINL=7, MAXL=7, CHSC=0,SDESCRIPTION="Office_878";
```

//Add the incoming call prefix for the videoconferencing service. The call prefix is, for example, 0755 (that is, the national toll area code of the local office).

```
ADD CNACLD: PFX=K'0755, MINL=4, MAXL=4, CHSC=0;
```

> 📖 **Note:**
>
> When the SMC holds a video conference, for a multimedia subscriber in the local office, the SMC sends the called number, in the format of national significant number, of the multimedia subscriber to SoftX3000 through signaling. That is, the format of the called number is "national toll area code + subscriber number". Accordingly, SoftX3000 has to perform the call prefix special processing on the national toll area code of the local office when analyzing that called number.

//Add number change. The number change index is 5.

```
ADD DNC: DCX=5, DCT=DEL, DCL=4;
```

> 📖 **Note:**
>
> The command means to delete the first four digits of the original number.

//Add call prefix special processing. The call prefix is 0755.

```
ADD PFXPRO: CSC=0, PFX="0755", CCF=YES, DDCX=5, ISREANA=YES;
```

 Note:

- In this example, the "callee change flag" parameter in the command must be set to "YES" and the "callee party number change index" parameter must be set to 5.
- It is recommended to set the "reanalysis" flag in the command to "YES" if it is not for a specific purpose.

IV. Configuring multimedia subscriber data

//Modify the common software parameter. (The modification is required only when SoftX3000 is connected to an OpenEye adopting the H.323 protocol.)

```
MOD PUBPRM: ID=P45, VAL=1;
```

//Add four multimedia devices adopting the H.323 protocol.

```
ADD MMTE: EID="8780011", MN=22, PT=H323, DT=TERMINAL, AT=ABE;
ADD MMTE: EID="8780012", MN=22, PT=H323, DT=TERMINAL, AT=ABE;
ADD MMTE: EID="8780013", MN=22, PT=H323, DT=TERMINAL, AT=ABE;
ADD MMTE: EID="8780014", MN=22, PT=H323, DT=TERMINAL, AT=ABE;
```

 Note:

- When a multimedia terminal adopts the H.323 protocol, the "equipment ID" parameter in the command must be set to be consistent with the terminal ID, for example, the telephone number, of the H.323 terminal.
- The "device type" parameter in the command must be set to "terminal", which is different from the configuration at the H.323 IAD side.

//Add four H.323 subscribers.

```
ADD MSBR: D=K'8780011, LP=0, EID="8780011", RCHS=87, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780012, LP=0, EID="8780012", RCHS=87, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780013, LP=0, EID="8780013", RCHS=87, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780014, LP=0, EID="8780014", RCHS=87, CSC=0, NS=CLIP-1;
```

4.5.3 Commissioning Guideline

After completing the preceding configurations, verify the service following the steps below.

I. Checking whether the network connection is normal

Use the ping utility in the interface tracing task on U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and the MCU, the SMC, or the iDo is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether the physical connections with network cables are normal and whether the IP routing data is configured correctly. After troubleshooting, proceed with the subsequent steps.

II. Checking whether the MCU has been registered normally

Use the **DSP EPST** command on U-SYS SoftX3000 Client to see whether the MCU has been registered normally, and then decide the next steps according to the returned result.

1) If "register" is displayed, it indicates that the MCU has been registered.
2) If "unregister" is displayed, it indicates that the MCU cannot be registered successfully. Use the **LST MCUCNF** command to check whether the "MCU IP address" parameter is configured correctly. Check whether data is configured correctly at the MCU side if no data configuration errors are found at the SoftX3000 side.

III. Checking whether the TCP connection between SoftX3000 and the SMC is normal

Use the **DSP SMCCON** command on U-SYS SoftX3000 Client to see whether the TCP connection between SoftX3000 and the SMC is normal, and then decide the next steps according to the returned result.

1) If "connect" is displayed, it indicates that the TCP connection between SoftX3000 and the SMC has been set up normally.
2) If "disconnect" is returned, it indicates that the TCP connection between SoftX3000 and the SMC cannot be set up normally. In this case, you can attempt to manually connect them by executing the **CON SMC** command. If the connection cannot be set up still, use the **LST IDOSMC** command to check whether the "SMC IP address" and "TCP port connected to SMC" parameters are configured correctly. Check whether data is configured correctly at the SMC side if no data configuration errors are found at SoftX3000 side.

IV. Testing service by holding a video conference

If the MCU registers normally and the TCP connection between SoftX3000 and the SMC is set up normally, you can use the iDo console to hold a video conference to test the service.

4.6 Configuring PBX Group Service

4.6.1 Introduction

I. Service description

Suppose the headquarter of a company is based in city B; the company has branches in city A and city C; one PBX is installed in each of the three cities for internal communication in the company. To facilitate the communication between the branches, the company has applied for the PBX group service in city B, that is, the PBXs of the company in the three cities access the SoftX3000 in city B through an IAD. See Figure 4-5 for the typical networking.
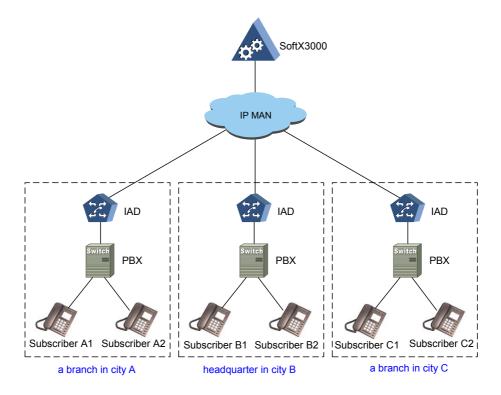
Figure 4-5 Networking of a company's PBX group

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1)   Each PBX has allocated telephone numbers for extensions uniquely, that is, no short numbers of the three PBXs can be the same.

2)   If each PBX is provided with the function of inserting "outgoing prefix for PBX group calls" before telephone numbers automatically, the PBX subscribers in

different cities can call each other by dialing the destination PBX extension numbers.

3) If each PBX does not support the above function and the outgoing prefix for PBX group calls is 9, the PBX subscribers in different cities can call each other by dialing "9 + destination PBX extension number".

4) For calls between PBX subscribers in different cities, the SoftX3000 charges them by the pilot number at the calling PBX side (the call type in a bill is the local PBX group call).

III. Interconnection parameters

Before configuring data at the SoftX3000 side, make sure that the following interconnection parameters have been negotiated with the PBXs, as shown in Table 4-5.

Table 4-5 Interconnection parameters between SoftX3000 and PBX

Serial No.	Parameter	Value
1	Outgoing prefix for PBX group calls	9
2	Duration of PBX announcement	3 seconds
3	PBX pilot number in city A	3332000
4	Internal short number numbering planning of the PBX in city A	2XXX
5	PBX pilot number of city B	6543000
6	Internal short number numbering planning of the PBX in city B	3XXX
7	PBX pilot number of city C	8784000
8	Internal short number numbering planning of the PBX in city C	4XXX

4.6.2 Script

I. Confiugring MG data

//Add an MGCP-based IAD in city A.

```
ADD MGW: EID="Guangzhou-iad0108-02.com", GWTP=IAD, MGWDESC="GZ-iad0108-02",
MGCMODULENO=22, PTYPE=MGCP, LA="191.169.150.30", RA1="61.169.150.132",
RP=2427, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,
UCATT=NOFX-0&NOM-0;
```

//Add an MGCP-based IAD in city B.

```
ADD MGW: EID="Beijing-iad0108-02.com", GWTP=IAD, MGWDESC="BJ-iad0108-02",
MGCMODULENO=22, PTYPE=MGCP, LA="191.169.150.30", RA1="62.169.150.132",
RP=2427, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,
UCATT=NOFX-0&NOM-0;
```

//Add an MGCP-based IAD in city C.

```
ADD MGW: EID="Shanghai-iad0108-02.com", GWTP=IAD, MGWDESC="SH-iad0108-02",
MGCMODULENO=22, PTYPE=MGCP, LA="191.169.150.30", RA1="63.169.150.132",
RP=2427, LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,
UCATT=NOFX-0&NOM-0;
```

Note:

Currently, the PBX group service can only be enabled in Huawei IAD (for example, IAD108 or IAD208), and the software version of the IAD must support the PBX group service.

II. Configuring PBX service data

//Add a PBX group connecting the IAD in city A. The PBX pilot number is 3332000.

```
ADD PBX: GDN=K'3332000, LP=0;
```

//Add a PBX group connecting the IAD in city B. The PBX pilot number is 6543000.

```
ADD PBX: GDN=K'6543000, LP=0;
```

//Add a PBX group connecting the IAD in city C. The PBX pilot number is 8784000.

```
ADD PBX: GDN=K'8784000, LP=0;
```

III. Configuring subscriber data

//Add a PBX group connecting the IAD in city A. The PBX pilot number is 3332000.

```
ADB   VSBR:   SD=K'3332010,   ED=K'3332017,   LP=0,   MN=22,   DID=ESL,
EID="Guangzhou-iad0108-02.com", STID=0, CODEC=PCMA, RCHS=33, CSC=0, AUT=PBXD,
NS=CLIP-1, GDN=K'3332000;
```

//Add a PBX group connecting the IAD in city B. The PBX pilot number is 6543000.

```
ADB    VSBR:   SD=K'6543010,   ED=K'6543017,   LP=0,    MN=22,    DID=ESL,
EID="Beijing-iad0108-02.com", STID=0, CODEC=PCMA, RCHS=65, CSC=0, AUT=PBXD,
NS=CLIP-1, GDN=K'6543000;
```

//Add a PBX group connecting the IAD in city C. The PBX pilot number is 8784000.

```
ADB    VSBR:   SD=K'8784010,   ED=K'8784017,   LP=0,    MN=22,    DID=ESL,
EID="Shanghai-iad0108-02.com", STID=0, CODEC=PCMA, RCHS=87, CSC=0, AUT=PBXD,
NS=CLIP-1, GDN=K'8784000;
```

 Note:

- You cannot define the PBX pilot numbers 3332000, 6543000 or 8784000 as PBX subscribers.
- You must set the call source code for each PBX subscriber correctly; otherwise, the charging of PBX group calls by the SoftX3000 will be affected.

IV. Configuring Centrex data

//Add a Centrex group. Set Centrex group number to 8, out-group prefix to 9, and capacity to 16.

```
ADD CXGRP: CGN="PBX group", CXG=8, OGP=K'9, DOD2=YES, UCPC=16;
```

 Note:

- The out-group prefix defined here is "out-group prefix for PBX group calls", that is, the prefix that must be sent by the PBX when a PBX group call is originated to the SoftX3000.
- Because it is unnecessary to define Centrex subscribers in the PBX group service, do not set too many subscribers in the Centrex group in order to save system resources.

//Add intra-Centrex prefixes (PBX group prefixes) 2, 3 and 4. Set both the maximum and minimum number lengths to 4 digits and PBX announcement duration to 3 seconds.

```
ADD ICXPFX: CXG=8, PFX=K'2, CSA=PIC, MINL=4, MAXL=4, LP=0, PBXIN=K'3332000,
PPTV=3;
ADD ICXPFX: CXG=8, PFX=K'3, CSA=PIC, MINL=4, MAXL=4, LP=0, PBXIN=K'6543000,
PPTV=3;
```

```
ADD ICXPFX: CXG=8, PFX=K'4, CSA=PIC, MINL=4, MAXL=4, LP=0, PBXIN=K'8784000,
PPTV=3;
```

 Note:

- Because the prefixes 2, 3, and 4 are used for PBX group calls, so the parameter "service attribute" in the command must be set to "PBX Intra-Centrex".
- For different PBX group prefixes, you must set correct PBX pilot numbers for them; otherwise, the PBX group service cannot be used.
- Generally, the PBX announcement duration configured at the SoftX3000 side should be equal to or a little longer than the actual announcement duration; otherwise, the PBX group service cannot be used.

V. Configuring number analysis data

//Add a call prefix.

```
ADD CNACLD: PFX=K'333, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_333";
ADD CNACLD: PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_654";
ADD CNACLD: PFX=K'878, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="Office_878";
```

4.6.3 Commissioning Guideline

After completing the preceding configurations, verify the service following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and each IAD is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the IAD has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the IAD has been registered normally, and then decide the next steps according to the returned result.

1) If "normal" is returned, it indicates that the IAD has been registered and its data configuration is correct.

2) If "disconnect" is displayed, it indicates that the IAD has been registered but is out of service now. In this case, check whether the related data at either side has been modified.

3) If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether the subscribers of the IAD are normal

If the IAD has been registered successfully, you can make an internal call in the IAD on a phone set. If the call can be put through, it means that data configuration is correct. If not, carry out the following operations:

1) Use **DSP EPST** to check if the terminals connecting the IAD have been registered. If not, use **LST VSBR** to check if module number, equipment ID, and termination ID are configured correctly.

2) If data configuration at the SoftX3000 side is correct, confirm if data configuration at the IAD side is correct.

IV. Testing service by making a call

Dial the PBX pilot number on a phone set of the local office. In normal cases, the caller should hear the announcement played by the PBX prompting to dial the destination extension number or to dial 0 for number query. When the announcement ends, the call can be put through after the caller dials the extension number. If the above function cannot be achieved, use **LST VSBR** to check if the parameter "PBX pilot number" of each PBX subscriber is correct.

V. Testing service by making a PBX group call

Take the PBX in city A as an example. Subscriber A1 dials an extension number "3XXX" or "9 + 3XXX" of the PBX in city B. Generally, the destination PBX extension in city B should ring immediately. If the destination PBX extension in city B does not ring, carry out the following operations:

1) Use **LST ICXPFX** to check if each PBX group prefix is the initials of the short numbers of the corresponding PBX, and if the "PBX pilot number" is set correctly.

2) Use **LST ICXPFX** to check if the PBX announcement duration corresponding to each PBX group prefix are equal to or a litter longer than the actual duration of each PBX.

4.7 Configuring ACC Service

4.7.1 Introduction

I. Configuration description

Before configuring the Account Card Calling (ACC) service at the SoftX3000 side, make sure that the media resource server (MRS) data and the intelligent network (IN) charging data has been configured and the signaling data regarding the networking between SoftX3000 and service control point (SCP) has been configured according to the signaling networking model between them. Otherwise, SoftX3000 cannot interconnect with SCP, and the ACC service cannot be used.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) Along with the SCP, SoftX3000 can provide the ACC service for subscribers. The ACC service is implemented in the dual-stage dialing mode.

2) Charge regarding the ACC service is implemented at the service switching point (SSP) side.

III. IN charging data

Before the configuration of the IN service data, a key interconnection parameter, "charging class", used for IN charging process ought to be negotiated with the SCP side, as shown in Table 4-6.

Table 4-6 Planning of "charging classes" between SoftX3000 and the SCP

Serial No.	Parameter	Value
1	Charging class for ordinary international toll calls	1
2	Charging class for ordinary national toll calls	2
3	Charging class for IP international toll calls	3
4	Charging class for IP national toll calls	4
5	Charging class for calls in the same business area	11
6	Charging class for calls between business areas	12
7	Charging class for calls to prefix "13X" in the local network	13
8	Charging class for calls to prefix "16X" in the local network	14
9	Charging class for calls to prefix "9XX" in the local network	15

IV. Service interconnection parameters

Before configuring data at the SoftX3000 side, make sure that the following service interconnection parameters have been negotiated with the SCP side, as shown in Table 4-7.

Table 4-7 Service interconnection parameters between SoftX3000 and SCP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of SCP	110a0a (national network)
3	ACC service access code	201
4	ACC service detection point (DP) number	3
5	ACC service key	201
6	Charging class for ordinary international toll calls	1
7	Charging class for ordinary national toll calls	2
8	Charging class for IP international toll calls	3
9	Charging class for IP national toll calls	4
10	Charging class for calls in the same business area	11
11	Charging class for calls between business areas	12
12	Charging class for calls to prefix "13X" in the local network	13
13	Charging class for calls to prefix "16X" in the local network	14
14	Charging class for calls to prefix "9XX" in the local network	15

4.7.2 Script

I. Configuring IN charging data

//Add holiday tariff discounts. The discount index is 300. The style is to discount the basic charge by forty percent. (It is assumed to define the tariff discounts in New Year Day and Labor Day in 2003.)

```
ADD   HLDDIS:   IDX=300,   YEAR=2003,   MON=JAN,   DAY=1,   STM="00&00&00",
ETM="23&59&59", DIS=60;
```

```
ADD   HLDDIS:   IDX=300,   YEAR=2003,   MON=MAY,   DAY=1,   STM="00&00&00",
ETM="23&59&59", DIS=60;
ADD   HLDDIS:   IDX=300,   YEAR=2003,   MON=MAY,   DAY=2,   STM="00&00&00",
ETM="23&59&59", DIS=60;
ADD   HLDDIS:   IDX=300,   YEAR=2003,   MON=MAY,   DAY=3,   STM="00&00&00",
ETM="23&59&59", DIS=60;
```

📖 Note:

The same charge discount index can be defined with more than one piece of discount data. In other words, when you use the **ADD HLDDIS**, **ADD WEKDIS**, **ADD NRMDIS**, and **ADD TIMEDIS** commands to add IN charge discount data, multiple configurations of the same command or multiple configurations of different commands can use the same charge discount index number.

//Add weekday tariff discounts. The style is to discount the basic charge consumed on Saturdays and Sundays by forty percent.

```
ADD WEKDIS: IDX=300, WEK=SUN, STM="00&00&00", ETM="23&59&59", DIS=60;
ADD WEKDIS: IDX=300, WEK=SAT, STM="00&00&00", ETM="23&59&59", DIS=60;
```

//Add normal tariff discounts. The style is to discount the basic charge by forty percent during two time segments, 00:00 to 08:00 and 21:00 to 24:00, every day.

```
ADD NRMDIS: IDX=300, STM="00&00&00", ETM="08&00&00", DIS=60;
ADD NRMDIS: IDX=300, STM="21&00&00", ETM="23&59&59", DIS=60;
```

//Add charging classes. Refer to Table 4-6 for the correspondence between charging classes and call types.

```
ADD CHGCLS: CLS=1, RAT=80, PRAT=80, TA=600, PA=1, TB=600, PB=1, IDX=300;
ADD CHGCLS: CLS=2, RAT=7, PRAT=7, TA=600, PA=1, TB=600, PB=1, IDX=300;
ADD CHGCLS: CLS=3, RAT=240, PRAT=240, TA=6000, PA=1, TB=6000, PB=1;
ADD CHGCLS: CLS=4, RAT=30, PRAT=30, TA=6000, PA=1, TB=6000, PB=1;
ADD CHGCLS: CLS=11, RAT=20, PRAT=10, TA=18000, PA=2, TB=6000, PB=1;
ADD CHGCLS: CLS=12, RAT=20, PRAT=20, TA=6000, PA=1, TB=6000, PB=1;
ADD CHGCLS: CLS=13, RAT=30, PRAT=30, TA=6000, PA=1, TB=6000, PB=1;
ADD CHGCLS: CLS=14, RAT=100, PRAT=100, TA=6000, PA=1, TB=6000, PB=1;
ADD CHGCLS: CLS=15, RAT=30, PRAT=30, TA=6000, PA=1, TB=6000, PB=1;
```

 Note:

- The unit of the metering time interval in the command is 10 milliseconds.
- Charging classes are key parameters for the interconnection between the SSP and the SCP, and must be set accordingly on both sides after careful negotiation.
- Because all IN services are charged at the SSP side in this example, detailed and complete charging class information should be defined at the SoftX3000 side. Otherwise, charge cannot be implemented at the SSP side.
- Whether to use charge discount policies on which calls is determined by the telecom carrier according to the actual situations.

II. Configuring DP data

//Add an IN call prefix 201.

```
ADD  CNACLD:  PFX=K'201,  CSTP=IN,  CSA=INSVR,  MINL=3,  MAXL=3,  CHSC=0,
SDESCRIPTION="ACC Service";
```

 Note:

- For the ACC service, the service category for the call prefix must be set to "intelligent service".
- Because the ACC service employs the dual-stage dialing mode, the minimum number length and the maximum number length of the call prefix are both defined as the length of the access code (3 in this example). The service attribute is set to "intelligent service".

//Add the access code description. The access code is 201.

```
ADD ACCODE: CODE=K'201, POS=255, DBLEN=255;
```

 Note:

Because it is not required to pick up the desired database number from the called number in the ACC service, the "database start position" and "database field length" parameters in the command are set to 255.

//Add the TDP configuration. The service key is 201.

```
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'201, SKEY=201, CALLSRC=0;
```

📖 **Note:**

- For the fixed IN service, the SSP employs the "analysis information" call model, that is, the DP number is 3.
- For the fixed IN service, access code is usually used as the detection criterion of the DP 3, that is, the DP criteria is set to "access code".

III. Configuring SCP and SSP data

//Add the SCP physical address description. The SCP number is 1. The DPC is 110a0a. The SCP connect type is "Connect SAU".

```
ADD SCPADDR: SCP=1, DPC="110a0a", SCT=SAU;
```

📖 **Note:**

- When SoftX3000 is interconnected with an independent SCP, (that is, when it is required to deploy other IN services besides the Internet Personal Number service in the local office) the range of the SCP number is 1 to 15.
- If SoftX3000 networks with SCP/SMCP in INAP over IP mode, you must set "SCP connect type" to "Connect SMCP or SCP"; otherwise, IN services cannot be used.

//Add the SSP physical address description. The SCP number is 1. The DPC of the SSP (that is, SoftX3000) is 001122.

```
ADD SSPADDR: SCP=1, DPC="001122";
```

//Add the SCP configuration. The Intelligent network application protocol (INAP) messages regarding the ACC service (with the service key 201) are processed by the SCP1.

```
ADD SCPCFG: SKEY=201, DB=65535, SCP0=NO, SCP1=YES, SNAME=ACC;
```

📖 **Note:**

Because it is not required to pick up the desired database number from the called number in the ACC service, the "database number" parameter in the command is set to 65535.

IV. Configuring IN announcement data

//Add language kind indexes. When the language position is 14, the corresponding language kind is ENG (English). When the language position is A0, the corresponding language kind is CHI (Chinese).

```
ADD LKNDIDX: SKEY="81", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="86", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="87", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="88", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="89", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8A", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8B", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8C", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8D", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8E", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8F", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="81", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="86", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="87", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="88", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="89", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8A", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8B", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8C", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8D", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8E", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8F", IDX="A0", KIN1=CHI;
```

📕 **Note:**

- The "service key" parameter in the command is different from that in general sense. This service key is a 2-digit hexadecimal number, used to identify the IN service to which the recorded announcement carried in a recorded announcement message ID belongs. Taking SCP device of Huawei as an example, 01 represents ACC, 02 represents free phone (FPH), and 08 represents number portability (NP).
- It should be noted that the configuration of this parameter should match the corresponding SCP version, that is, different SCP versions might have different definitions on service key. In this example, 81   8F all stand for the card services.

4.7.3 Commissioning Guideline

I. Checking whether the signaling connection between SoftX3000 and SCP is normal

Check whether the SCCP connection or INAP over IP connection between the SoftX3000 and the SCP is normal according to the signaling networking model between the SoftX3000 and the SCP and the description in Chapter 2 of this manual.

II. Checking whether the SoftX3000 can normally trigger the IN service (calling stage)

Start "TCAP User Message" in the interface tracing task on U-SYS SoftX3000 Client, and then dial the ACC access code 201 on a phone set.

1) If the system does not prompt wrong number and messages interacted between the Transaction Capabilities Application Part (TCAP) and Users can be traced, such as TC_INVOKE_REQ, TC_CONTINUE_REQ, TC_INVOKE_IND, and TC_CONTINUE_IND, it indicates that the SoftX3000 can trigger the IN service successfully.

2) If the system prompts wrong number or the interaction messages between TCAP and User cannot be traced, it indicates that SoftX3000 cannot trigger the IN service. Use the **LST CNACLD** command to check whether the service category of the prefix 201 is set to "intelligent service" and whether the service attribute, the minimum number length, and the maximum number length of the prefix are configured correctly.

III. Checking whether the SCP can correctly instruct SoftX3000 to play recorded announcements and collect dialed digits (interaction stage)

After SoftX3000 triggers an IN service, SoftX3000 and the SCP enter the interaction stage. Continue to observe the traced messages by "TCAP User Message".

1) If the system correctly plays appropriate recorded announcements depending on the logics defined in the ACC service and prompts you to select a language, input card number and password, and input a called number, it indicates that the SCP can correctly instruct SoftX3000 to play announcements and collect dialed digits.

2) If TC_U_ERROR_IND is found from the traced messages, it indicates that the service interconnection between SoftX3000 and the SCP is abnormal. Use **LST ACCODE**, **LST TDPCFG**, **LST SCPADDR**, **LST SSPADDR**, and then **LST SCPCFG** at the SoftX3000 side to check whether the access code, the DP number, the service key, the DPC of the SCP, the SCP number corresponding to the service key are configured correctly. Check whether data is configured correctly at the SCP side if no data configuration errors are found at the SoftX3000 side.

3) If TC_U_ERROR_IND is not included in the traced messages but the system cannot normally play recorded announcements yet, use **LST LKND** and **LST LKNDIDX** at the SoftX3000 side to check whether the language kind, the service key, and the language position are configured correctly. If the preceding parameters are configured correctly, check whether MRS data is configured correctly and whether related voice files are loaded to the MRS successfully.

IV. Checking whether the call can be normally connected (connection stage)

If the SCP correctly instructs SoftX3000 to play announcements and collect dialed digits, in normal cases, SoftX3000 can connect the call to the called subscriber and the calling subscriber can use the outgoing call function. If the system immediately prompts a connection failure, use the **LST CNACLD** command to check whether the call prefix corresponding to the called number is correctly configured at the SSP side.

V. Checking whether charges regarding the IN service are normally implemented

According to the charging classes defined in the system, originate each type of call on a phone set for testing purposes and then query the balance in the card number to check whether the charges regarding the IN service are normally implemented.

1) If a call is not charged correctly, use the **LST CHGCLS** command to check whether charging class parameters are configured correctly, such as TA charge rate, PB independent tariff, initial metering time interval, initial metering pulse count, metering time interval, and metering pulse count.

2) If a call cannot be charged, check with the SCP side whether charging class parameters are configured completely and consistently at both sides.

4.8 Configuring APS Service

4.8.1 Introduction

I. Configuration description

Before configuring the advanced prepaid service (APS) at the SoftX3000 side, make sure that the MRS data and the IN charging data has been configured and the signaling data regarding the networking between SoftX3000 and SCP has been configured according to the signaling networking model between them. Otherwise, SoftX3000 cannot interconnect with SCP and the APS cannot be used.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side.

1) With the cooperation from the SCP, SoftX3000 can provide the APS service for users. The APS service can be implemented both in the single-stage dialing mode and in the dual-stage dialing mode. The dual-stage dialing mode is usually used for balance query and card number recharge functions.

2) Charge regarding the APS service is implemented at the service switching point (SSP) side.

III. IN charging data

Before the configuration of the IN service data, a key interconnection parameter, "charging class", used for IN charging process ought to be negotiated with the SCP side, as shown in Table 4-8.

Table 4-8 Planning of "charging classes" between SoftX3000 and the SCP

Serial No.	Parameter	Value
1	Charging class for ordinary international toll calls	1
2	Charging class for ordinary national toll calls	2
3	Charging class for IP international toll calls	3
4	Charging class for IP national toll calls	4
5	Charging class for calls in the same business area	11
6	Charging class for calls between business areas	12
7	Charging class for calls to prefix "13X" in the local network	13
8	Charging class for calls to prefix "16X" in the local network	14
9	Charging class for calls to prefix "9XX" in the local network	15

IV. Service interconnection parameters

Before configuring data at the SoftX3000 side, make sure that the following service interconnection parameters have been negotiated with the SCP side, as shown in Table 4-9.

Table 4-9 Service interconnection parameters between SoftX3000 and SCP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of SCP	110b0b (national network)
3	APS access code (single-stage dialing mode)	213

Serial No.	Parameter	Value
4	APS access code (dual-stage dialing mode)	96338
5	APS detection point (DP) number	3
6	APS service key	213
7	Charging class for ordinary international toll calls	1
8	Charging class for ordinary national toll calls	2
9	Charging class for IP international toll calls	3
10	Charging class for IP national toll calls	4
11	Charging class for calls in the same business area	11
12	Charging class for calls between business areas	12
13	Charging class for calls to prefix "13X" in the local network	13
14	Charging class for calls to prefix "16X" in the local network	14
15	Charging class for calls to prefix "9XX" in the local network	15

4.8.2 Script

I. Configuring IN charging data

Refer to Section 4.7   Configuring ACC Service in this chapter for the configuration script regarding IN charging data.

II. Configuring DP data

//Add IN call prefixes. The call prefix in the single-stage dialing mode is 213 and the call prefix in the dual-stage dialing mode is 96338.

```
ADD  CNACLD:  PFX=K'213,  CSTP=IN,  CSA=SPSFDN,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="APS Service";
ADD  CNACLD:  PFX=K'96338,  CSTP=IN,  CSA=INSVR,  MINL=5,  MAXL=5,  CHSC=0,
SDESCRIPTION="APS Service";
```

📖 **Note:**

- For the APS service, the service category for the call prefixes must be set to "intelligent service".
- For the APS service in the single-stage dialing mode, the minimum number length for the corresponding call prefix is set to the length of the access code (3 in this example) and the maximum number length is set to a possibly great value (24 in this example). In this case, the service attribute is set to "special function number".
- For the APS service in the dual-stage dialing mode, the minimum number length and the maximum number length for the call prefix are both defined as the length of the access code (5 in this example). The service attribute is set to "intelligent service".

//Add access code description. The access code in the single-stage dialing mode is 213 and the access code in the dual-stage dialing mode is 96338.

```
ADD ACCODE: CODE=K'213, POS=255, DBLEN=255;
ADD ACCODE: CODE=K'96338, POS=255, DBLEN=255;
```

📖 **Note:**

Because it is not required to pick up the desired database number from the called number in the APS service, the "database start position" and "database field length" parameters in the command are set to 255.

//Add TDP configuration. 213 is the service key in both single-stage dialing mode and dual-stage dialing mode.

```
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'213, SKEY=213, CALLSRC=0;
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'96338, SKEY=213, CALLSRC=0;
```

📖 **Note:**

- For the fixed IN service, the SSP employs the "analysis information" call model, that is, the DP number is 3.
- For the fixed IN service, access code is usually used as the detection criterion of the DP 3, that is, the DP criteria is set to "access code".

III. Configuring SCP and SSP data

//Add the SCP physical address description. The SCP number is 2. The DPC is 110b0b. The "SCP connect type" is "Connect SMCP or SCP".

```
ADD SCPADDR: SCP=2, DPC="110b0b", SCT=SMCP_SCP;
```

📖 **Note:**

- When SoftX3000 is interconnected with an independent SCP, (that is, when it is required to deploy other IN services besides the Internet Personal Number service in the local office) the range of the SCP number is 1 to 15.
- If SoftX3000 networks with SCP/SMCP in INAP over IP mode, you must set "SCP connect type" to "Connect SMCP or SCP"; otherwise, IN services cannot be used.

//Add the SSP physical address description. The SCP number is 2. The DPC of the SSP (that is, SoftX3000) is 001122.

```
ADD SSPADDR: SCP=2, DPC="001122";
```

//Add the SCP configuration. The intelligent network application protocol (INAP) messages regarding the APS service (with the service key 213) are processed by the SCP2.

```
ADD SCPCFG: SKEY=213, DB=65535, SCP0=NO, SCP2=YES, SNAME=ACC;
```

📖 **Note:**

Because it is not required to pick up the desired database number from the called number in the APS service, the "database number" parameter in the command is set to 65535.

IV. Configuring IN announcement data

//Add language kind indexes. When the language position is 14, the corresponding language kind is ENG (English). When the language position is A0, the corresponding language kind is CHI (Chinese).

```
ADD LKNDIDX: SKEY="01", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="01", IDX="A0", KIN1=CHI;
```

📖 **Note:**

- The "service key" parameter in the command is different from that in general sense. This service key is a 2-digit hexadecimal number, used to identify the IN service to which the recorded announcement carried in a recorded announcement message ID belongs. Taking SCP device of Huawei as an example, 01 represents ACC, 02 represents FPH, and 08 represents NP.
- It should be noted that the configuration of this parameter should match the corresponding SCP version, that is, different SCP versions might have different definitions on service key. In this example, 01 represents the ACC service.

V. Configuring number analysis data

//Add a number change. The number change index is 15. 213 is inserted before the called number.

```
ADD DNC: DCX=15, DCT=INS, ND=K'213;
```

//Add a call source. The call source code is 9. The number of pre-receive digits is 3. The number change index is 15.

```
ADD CALLSRC: CSC=9, CSCNAME="APS User", PRDN=3, DCX=15;
```

📖 **Note:**

The new call source code is used for APS user. To trigger the APS at the SoftX3000 side, a number change must be performed for user in this call source, that is, 213 is inserted before the called number dialed by APS user.

//Modify subscriber attributes. Modify to 9 the call source code for the subscriber numbers from 8780200 to 8780203.

```
MOD VSBR: D=K'8780200, LP=0, CSC=9;
MOD VSBR: D=K'8780201, LP=0, CSC=9;
MOD VSBR: D=K'8780202, LP=0, CSC=9;
MOD VSBR: D=K'8780203, LP=0, CSC=9;
```

4.8.3 Commissioning Guideline

I. Checking whether signaling connection between SoftX3000 and SCP is normal

Check whether SCCP connection or INAP over IP connection between SoftX3000 and SCP is normal according to the signaling networking model between SoftX3000 and SCP and the description in Chapter 2.

II. Checking whether SoftX3000 can normally trigger the IN service (calling stage)

Start "TCAP User Message" in the interface tracing task on U-SYS SoftX3000 Client, and then dial the dual-stage dialing APS access code 96338 on a phone set.

1)   If the system does not prompt number errors and interaction messages between the transaction capabilities application part (TCAP) and the User can be traced, such as TC_INVOKE_REQ, TC_CONTINUE_REQ, TC_INVOKE_IND, and TC_CONTINUE_IND, it indicates that SoftX3000 can normally trigger the IN service.

2)   If the system prompts a number error or the interaction messages between TCAP and User cannot be traced, it indicates that SoftX3000 cannot trigger the IN service. Use the **LST CNACLD** command to check whether the service category of the prefix 96338 is set to "intelligent service" and whether the service attribute, the minimum number length, and the maximum number length of the prefix are configured correctly.

III. Checking whether the SCP can correctly instruct SoftX3000 to play recorded announcements and collect dialed digits (interaction stage)

After SoftX3000 triggers an IN service, SoftX3000 and the SCP enter the interaction stage. Continue to observe the traced messages by "TCAP User Message".

1)   If the system correctly plays appropriate recorded announcements depending on the logics defined in the APS service and prompts you to select a language, input card number and password, and input a called number, it indicates that the SCP can correctly instruct SoftX3000 to play announcements and collect dialed digits.

2)   If TC_U_ERROR_IND is found from the traced messages, it indicates that the service interconnection between SoftX3000 and the SCP is abnormal. Use **LST ACCODE**, **LST TDPCFG**, **LST SCPADDR**, **LST SSPADDR**, and then **LST SCPCFG** at the SoftX3000 side to check whether the access code, the DP number, the service key, the DPC of the SCP, the SCP number corresponding to the service key are configured correctly. Check whether data is configured correctly at the SCP side if no data configuration errors are found at the SoftX3000 side.

3) If TC_U_ERROR_IND is not included in the traced messages but the system
cannot normally play recorded announcements yet, use **LST LKND** and **LST
LKNDIDX** at the SoftX3000 side to check whether the language kind, the service
key, and the language position are configured correctly. If the preceding
parameters are configured correctly, check whether MRS data is configured
correctly and whether related voice files are loaded to the MRS successfully.

IV. Checking whether the call can be normally connected (connection stage)

If the SCP correctly instructs SoftX3000 to play announcements and collect dialed
digits, in normal cases, SoftX3000 can connect the call to the called subscriber and the
calling subscriber can use the outgoing call function. If the system immediately prompts
a connection failure, use the **LST CNACLD** command to check whether the call prefix
corresponding to the called number is correctly configured at the SSP side.

**V. Checking whether charges regarding the IN service are normally
implemented**

According to the charging classes defined in the system, originate each type of call on a
phone set for testing purposes and then query the balance in the card number to check
whether the charges regarding the IN service are normally implemented.

1) If a call is not charged correctly, use the **LST CHGCLS** command to check
whether charging class parameters are configured correctly, such as TA charge
rate, PB independent tariff, initial metering time interval, initial metering pulse
count, metering time interval, and metering pulse count.

2) If a call cannot be charged, check with the SCP side whether charging class
parameters are configured completely and consistently at both sides.

VI. Checking whether the single-stage dialing APS service is normal

Because the single-stage dialing APS service does not pass an interaction stage,
SoftX3000 directly enters the connection stage after triggering the IN service. The
single-stage dialing APS service is used in the same way as an ordinary call is made.
You can directly dial a called number on a phone set. After the called number is dialed,
normally, SoftX3000 immediately connects the call to the called subscriber to achieve
the outgoing call function of the calling subscriber. The following cases might occur.

1) Although the system successfully connects the call to the called subscriber, the
connection speed is very slow. In this case, use the **LST CNACLD** command to
check whether the service attribute of the prefix 213 is set to "special function
number" and whether the minimum number length and the maximum number
length for the prefix are configured correctly.

2) If the system fails to connect the call to the called subscriber and
TC_U_ERROR_IND is found from the traced messages, it indicates that the
service interconnection between SoftX3000 and the SCP is abnormal. Use **LST**

ACCODE, **LST TDPCFG**, **LST SCPADDR**, **LST SSPADDR**, and then **LST SCPCFG** at the SoftX3000 side to check whether the access code, the DP number, the service key, the DPC of the SCP, the SCP number corresponding to the service key are configured correctly. Check whether data is configured correctly at the SCP side if no data configuration errors are found at the SoftX3000 side.

4.9 Configuring NP Service

4.9.1 Introduction

I. Description

Before configuring the number portability (NP) service at the SoftX3000 side, make sure that MRS data and IN charging data has been configured and the signaling data regarding the networking between SoftX3000 and SCP has been configured according to the signaling networking model between them. Otherwise, SoftX3000 cannot interwork with SCP and the NP service cannot be used.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) With the cooperation from the SCP, SoftX3000 can provide the NP called service with the access code 500. (The NP called service is also known as "NP incoming service".)

2) With the cooperation from the SCP, SoftX3000 can provide the NP caller service with the access code 501. (The NP caller service is also known as "NP outgoing service".)

3) Charge regarding the NP caller service is implemented at the service switching point (SSP) side.

III. IN charging data

Before the configuration of the IN service data, a key interconnection parameter, "charging class", used for IN charging process ought to be negotiated with the SCP side, as shown in Table 4-10.

Table 4-10 Planning of "charging classes" between SoftX3000 and the SCP

Serial No.	Parameter	Value
1	Charging class for ordinary international toll calls	1
2	Charging class for ordinary national toll calls	2
3	Charging class for IP international toll calls	3

Serial No.	Parameter	Value
4	Charging class for IP national toll calls	4
5	Charging class for calls in the same business area	11
6	Charging class for calls between business areas	12
7	Charging class for calls to prefix "13X" in the local network	13
8	Charging class for calls to prefix "16X" in the local network	14
9	Charging class for calls to prefix "9XX" in the local network	15

IV. Service interconnection parameters

Before configuring data at the SoftX3000 side, make sure that the following service interconnection parameters have been negotiated with the SCP side, as shown in Table 4-11.

Table 4-11 Service interconnection parameters between SoftX3000 and SCP

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122 (national network)
2	Signaling point code of SCP	110c0c (national network)
3	Format for NP number sent by SoftX3000 to SCP	Subscriber number (without area code)
4	Format for NP number sent by SCP to SoftX3000	Subscriber number (without area code)
5	NP called service access code	500
6	NP caller service access code	501
7	NP service detection point (DP) number	3
8	NP service key	500
9	Charging class for ordinary international toll calls	1
10	Charging class for ordinary national toll calls	2
11	Charging class for IP international toll calls	3
12	Charging class for IP national toll calls	4
13	Charging class for calls in the same business area	11
14	Charging class for calls between business areas	12

Serial No.	Parameter	Value
15	Charging class for calls to prefix "13X" in the local network	13
16	Charging class for calls to prefix "16X" in the local network	14
17	Charging class for calls to prefix "9XX" in the local network	15

4.9.2 Script

I. Configuring IN charging data

Refer to Section 4.7   Configuring ACC Service in this chapter for the configuration script regarding IN charging data.

II. Configuring DP data

//Add IN call prefixes. The prefix for the NP called service is 500. The prefix for the NP caller service is 501.

```
ADD  CNACLD:  PFX=K'500,  CSTP=IN,  CSA=INSVR,  MINL=10,  MAXL=10,  CHSC=0,
SDESCRIPTION="NP Called Service";
ADD  CNACLD:  PFX=K'501,  CSTP=IN,  CSA=SPSFDN,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="NP Caller Service";
```

 Note:

- For the NP service, the service category for the call prefix must be set to "intelligent service".
- For the NP called service, the minimum number length and the maximum number length for the call prefix are both defined as the length of the "access code + called subscriber number" (10 in this example). The service attribute is set to "intelligent service".
- For the NP caller service, the minimum number length for the corresponding call prefix is set to the length of the access code (3 in this example) and the maximum number length is set to a possibly great value (24 in this example). In this case, the service attribute is set to "special function number".

//Add access code descriptions. The NP called service access code is 500. The NP caller service access code is 501.

```
ADD ACCODE: CODE=K'500, POS=255, DBLEN=255;
ADD ACCODE: CODE=K'501, POS=255, DBLEN=255;
```

Note:

Because it is not required to pick up the desired database number from the called number in both IN services in this example, the "database start position" and "database field length" parameters in the command are set to 255.

//Add TDP configurations. 500 is the service key for both the NP called service and the NP caller service.

```
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'500, SKEY=500, CALLSRC=0;
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'501, SKEY=500, CALLSRC=0;
```

Note:

- For the fixed IN service, the SSP employs the "analysis information" call model, that is, the DP number is 3.
- For the fixed IN service, access code is usually used as the detection criterion of the DP 3, that is, the DP criteria is set to "access code".

III. Configuring SCP and SSP data

//Add the SCP physical address description. The SCP number is 3. The DPC is 110c0c. The "SCP connect type" is "Connect SAU".

```
ADD SCPADDR: SCP=3, DPC="110c0c", SCT=SAU;
```

Note:

- When SoftX3000 is interconnected with an independent SCP, (that is, when it is required to deploy other IN services besides the Internet Personal Number service in the local office) the range of the SCP number is 1 to 15.
- If SoftX3000 networks with SCP/SMCP in INAP over IP mode, you must set "SCP connect type" to "Connect SMCP or SCP"; otherwise, IN services cannot be used.

//Add the SSP physical address description. The SCP number is 3. The DPC of the SSP (that is, SoftX3000) is 001122.

```
ADD SSPADDR: SCP=3, DPC="001122";
```

//Add the SCP configuration. The intelligent network application protocol (INAP) messages regarding the NP service (with the service key 500) are processed by the SCP3.

```
ADD SCPCFG: SKEY=500, DB=65535, SCP0=NO, SCP3=YES, SNAME=PPS;
```

 Note:

Because it is not required to pick up the desired database number from the called number in both IN services in this example, the "database number" parameter in the command is set to 65535.

IV. Configuring IN announcement data

//Add language kind indexes. When the language position is 14, the corresponding language kind is ENG (English). When the language position is A0, the corresponding language kind is CHI (Chinese).

```
ADD LKNDIDX: SKEY="08", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="08", IDX="A0", KIN1=CHI;
```

 Note:

- The "service key" parameter in the command is different from that in general sense. This service key is a 2-digit hexadecimal number, used to identify the IN service to which the recorded announcement carried in a recorded announcement message ID belongs. Taking SCP device of Huawei as an example, 01 represents ACC, 02 represents FPH, and 08 NP.
- It should be noted that the configuration of this parameter should match the corresponding SCP version, that is, different SCP versions might have different definitions on service key. In this example, 08 represents the NP service.

V. Configuring data specific to the NP called service

//Add number change data. The number change index is 12. 500 is inserted before the called number.

```
ADD DNC: DCX=12, DCT=INS, ND=K'500;
```

📖 **Note:**

500 to be inserted is the NP called service access code, used to trigger an NP service at the SoftX3000 side.

//Add the call failure processing. The failure cause is "remove phone reserve number". The failure source code is 0. The processing type is "re-analysis after number change". The number change index is 12.

```
ADD CFPRO: FCC=YJLH, FSC=0, FPT=CPA, DCX=12;
```

📖 **Note:**

In the command, the failure cause code must be set to "remove phone reserve number" and the failure processing type must be set to "re-analysis after number change". Otherwise, SoftX3000 cannot trigger the NP service normally.

//Add the service special signaling. The service key is 500.

```
ADD SRVSIG: SK=500, SIG=PA-1;
```

📖 **Note:**

In the NP called service, after the SCP sends a play-announcement (PA) operation to the SSP, it is required to instruct the local office to send an answer message instead of the default answer signal to the opposite office. To achieve that, you need to use the **ADD SRVSIG** command to add a special signaling for the IN service. The purpose is to prevent the local office from returning an address complete signal to misguide the opposite to charge such a call.

//Set the subscriber 8780204 to be in the "phone removed and number reserved" state.

```
PKR SBR: SDN=K'8780204, LP=0;
```

📖 **Note:**

- After this command is executed, the system automatically releases the port resource, that is, the equipment ID, occupied by the subscriber number 8780204.
- When a call is routed to the subscriber 8780204 in the "phone removed and number reserved" state, SoftX3000 automatically inserts 500 before the called number, that is, 8780204, and re-analyzes the called number. In this case, the system triggers an NP service based on the prefix 500.

VI. Configuring data specific to the NP caller service

//Add number change data. The number change index is 13. 501 is inserted before the called number.

```
ADD DNC: DCX=13, DCT=INS, ND=K'501;
```

//Add a call source. The call source code is 8. The number of pre-receive digits is 3. The number change index is 13.

```
ADD CALLSRC: CSC=8, CSCNAME="NP User", PRDN=3, DCX=13;
```

📖 **Note:**

The new call source code is used for NP user. To trigger the NP caller service at the SoftX3000 side, a number change must be performed for user in this call source, that is, 501 is inserted before all call prefixes dialed by NP user.

//Modify subscriber attributes. The subscriber number is 8780214. The new call source code is 8.

```
MOD VSBR: D=K'8780214, LP=0, CSC=8;
```

📖 **Note:**

When a subscriber is in the "number changed" state, only the subscriber attributes of the new subscriber number can be modified. The subscriber attributes of the original subscriber number cannot be modified.

4.9.3 Commissioning Guideline

The commissioning steps for the NP called service are described in this section. You can conduct the commissioning for the NP caller service in the same way.

I. Checking whether signaling connection between SoftX3000 and SCP is normal

Check whether SCCP connection or INAP over IP connection between SoftX3000 and SCP is normal according to the signaling networking model between SoftX3000 and SCP and the description in Chapter 2.

II. Checking whether SoftX3000 can normally trigger the IN service (calling stage)

Start "TCAP User Message" in the interface tracing task on U-SYS SoftX3000 Client, and then dial the original number of the NP subscriber, **8780204**, on a phone set.

1) If the system does not prompt number errors and interaction messages between the transaction capabilities application part (TCAP) and the User can be traced, such as TC_INVOKE_REQ, TC_CONTINUE_REQ, TC_INVOKE_IND, and TC_CONTINUE_IND, it indicates that SoftX3000 can normally trigger the IN service.

2) If the system prompts a number error or the interaction messages between TCAP and User cannot be traced, it indicates that SoftX3000 cannot trigger the IN service. Use the **LST CNACLD** command to check whether the service category of the prefix 500 is set to "intelligent service" and whether the service attribute, the minimum number length, and the maximum number length of the prefix are configured correctly.

3) If the system still prompts a number error or the interaction messages between TCAP and User cannot be traced, use the **LST DNC** command to check whether the number to be inserted is 500 and then use the **LST CFPRO** command to check whether the failure cause code, the failure processing type, and the number change index are configured correctly.

III. Checking whether the NP called service can be implemented normally (connection stage)

When SoftX3000 triggers the IN service, if the NP service is defined to play a recorded announcement before the automatic connection, SoftX3000 plays an announcement to the calling subscriber to notify the calling subscriber of the change of the dialed number and then connects the call to the new subscriber number. If SoftX3000 fails to connect the call, continue to observe the traced messages by "TCAP User Message".

If TC_U_ERROR_IND is found from the traced messages, it indicates that the service interconnection between SoftX3000 and the SCP is abnormal. Use **LST ACCODE**, **LST TDPCFG**, **LST SCPADDR**, **LST SSPADDR**, and then **LST SCPCFG** at the SoftX3000 side to check whether the access code, the DP number, the service key, the DPC of the SCP, the SCP number corresponding to the service key are configured correctly. Check whether data is configured correctly at the SCP side if no data configuration errors are found at the SoftX3000 side.

4.10 Configuring Anonymous Card Number Service

4.10.1 Introduction

I. Service configuration

Before configuring data for the anonymous card number service at the SoftX3000 side, make sure that the MRS data and IN charging data as well as the signaling data for the networking between the SoftX3000 and the SCP has been set. Otherwise, the SoftX3000 cannot interconnect with the SCP and anonymous card number service cannot be used.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) The SoftX3000 can provide the anonymous card number service in cooperation with the SCP. This service is implemented in one-stage dialing mode.
2) The anonymous card number service is charged at the SSP side.

III. Planning of IN charging data

Before configuring IN service data at the SoftX3000 side, make sure that the key interconnection parameter "charging class" used for IN service charging has been planned and negotiated with the SCP. See Table 4-12 for details.

Table 4-12 Planning of "charging class" between the SoftX3000 and the SCP

Serial No.	Parameter	Value
1	Charging class of common international toll calls	1
2	Charging class of common national toll calls	2
3	Charging class of IP international toll calls	3
4	Charging class of common national toll calls	4

Serial No.	Parameter	Value
5	Charging class of intra-office calls	11
6	Charging class of inter-office calls	12
7	Charging class of the prefix "13X" for local calls	13
8	Charging class of the prefix "16X" for local calls	14
9	Charging class of the prefix "9XX" for local calls	15

IV. Interconnection parameters

Before configuring data at the SoftX3000 side, make sure that the following interconnection parameters have been negotiated with the SCP and OpenEye, as shown in Table 4-13.

Table 4-13 Interconnection parameters between SoftX3000 and SCP and OpenEye

Serial No.	Parameter	Value
1	SPC of SoftX3000	001122 (national network)
2	SCP SPC	110f0f (national network)
3	Access code of the anonymous card number service	230
4	DP number of the anonymous card number service	3
5	Service key of the anonymous card number service	230
6	Charging class of common international toll calls	1
7	Charging class of common national toll calls	2
8	Charging class of IP international toll calls	3
9	Charging class of IP national toll calls	4
10	Charging class of intra-office calls	11
11	Charging class of inter-office calls	12
12	Charging class of the prefix "13X" for local calls	13
13	Charging class of the prefix "16X" for local calls	14

Serial No.	Parameter	Value
14	Charging class of the prefix "9XX" for local calls	15
15	Anonymous card flag character string	PureCard
16	Anonymous card flag character string	HuaWei

4.10.2 Script

I. Configuring IN charging data

Refer to 4.7   Configuring ACC Service for the IN charging data script.

II. Configuring DP data

//Add an IN call prefix 230.

```
ADD  CNACLD:  PFX=K'230,  CSTP=IN,  CSA=SPSFDN,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="Anonymous card Service";
```

  Note:

- For the anonymous card number service, the service category of the call prefix must be set to "Intelligent service".
- The anonymous card number service applies one-stage dialing, so the minimum length of the call prefix is generally defined as the length of the access code (it is 3 in the example), but the maximum length of the call prefix is set to a bigger value (it is 24 in the example). In this case, you need to set "Service attribute" to "special function number".

//Add an access code 230. Set "Service type" to "the anonymous card number service".

```
ADD ACCODE: CODE=K'230, POS=255, DBLEN=255, SRVTYPE=ANONCRD;
```

 Note:

- For the anonymous card number service, the parameter "service type" in the command must be set to "the anonymous card number service"; otherwise, the SoftX3000 cannot trigger the anonymous card number service.
- Because the anonymous card number service requires no database number obtained from the called number, the parameters "Database start position" and "Database field length" must be both set to 255.

//Add TDP configuration. Set service key to 230.

```
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'230, SKEY=230, CALLSRC=0;
```

 Note:

- The fixed IN services use the "analysis information" call model at the SSP side generally, that is, the DP number is 3.
- The fixed IN services use the access code as the detection condition of DP3, that is, DP criteria number is "access code".

III. Configuring SCP and SSP data

//Add SCP physical address description. Set SCP number to 5, DPC to 110a0a, and SCP connect type to "Connect SAU".

```
ADD SCPADDR: SCP=5, DPC="110f0f", SCT=SAU;
```

 Note:

- When the SoftX3000 interconnects with an independent SCP, that is, the other IN services than the IPN service need be enabled in the local office, SCP number can only start from 1 and ranges from 1 to 15.
- If the SoftX3000 networks with the SCP/SMCP through INAP over IP, you must set "SCP connect type" to "Connect SMCP or SCP"; otherwise, IN services cannot be used.

//Add SSP physical address description. Set SCP number to 5 and DPC of SSP (SoftX3000) is 001122.

```
ADD SSPADDR: SCP=5, DPC="001122";
```

//Add SCP configuration. Set that the INAP messages of the anonymous card number service (service key: 230) are processed by SCP5.

```
ADD SCPCFG: SKEY=230, DB=65535, SCP0=NO, SCP5=YES, SNAME=PPS;
```

 Note:

The anonymous card number service requires no database number obtained from the called number, so the parameter "database number" in the command must be set to 65535.

IV. Configuring IN announcement data

//Add indexes for languages. When the language bit is 14, the corresponding language is ENG (English). When the language bit is A0, the corresponding language is CHI (Chinese).

```
ADD LKNDIDX: SKEY="81", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="86", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="87", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="88", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="89", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8A", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8B", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8C", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8D", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8E", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="8F", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="81", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="86", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="87", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="88", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="89", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8A", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8B", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8C", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8D", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8E", IDX="A0", KIN1=CHI;
ADD LKNDIDX: SKEY="8F", IDX="A0", KIN1=CHI;
```

📖 **Note:**

- The parameter "Service key" in the command is different from that in common sense, for it is a 2-bit hex identifying the IN service to which the recorded announcement in the recorded announcement message ID belongs.
- The configuration of the "Service key" differs depending on different SCP versions. That is, different SCPs define the service key differently. In this example, 81–8F stand for the card number service.

V. Configuring dedicated data of the anonymous card number service

//Add an office direction 230 for SIP trunk selfloop.

```
ADD OFC: O=230, ON="For SIP trunk", DOT=CC, DOL=LOW, METHOD=NOCONV;
```

//Add a sub-route numbered 230.

```
ADD SRT: SRC=230, O=230, SRN="For SIP trunk", TSM=CYC;
```

//Add a route numbered 230.

```
ADD RT: R=230, RN="For SIP trunk", SR1=230;
```

//Add an SIP trunk group numbered 230.

```
ADD  SIPTG:  TG=230,  SRT=230,  TGN="Anonymous  card",  IMN=132,
OSU="191.169.150.30", UHB=NO, VEDIOS=SUPPORT, SGCTRL=SVR15-1;
```

📖 **Note:**

- Because the SIP trunk group is used for selfloop, the parameter "Remote URI" in the command must be set to the IP address of the IFMI of the local office, which is 191.169.150.30 in the example.
- You must select "Anonymous card auth by SX3000" for "software parameter of signalling control" in the example because the SoftX3000 sends the card number and password sent by the SIP soft terminal to the SCP for authentication through INAP message.

//Add anonymous card number data. Set "String of card flag" to "PureCard" and "Huawei" and "SIP trunk group number" to 230.

```
ADD SOCF: SCF="PureCard", TG=230;
```

```
ADD SOCF: SCF="Huawei", TG=230;
```

4.10.3 Commissioning Guideline

I. Checking if the signaling connection between SoftX3000 and SCP is normal

Check whether the SCCP connection or INAP over IP connection between the SoftX3000 and the SCP is normal according to the signaling networking model between the SoftX3000 and the SCP and the description in Chapter 2 of this manual.

II. Checking whether the SoftX3000 can normally trigger the IN service (calling stage)

Start "TCAP User Message" in the interface tracing task on U-SYS SoftX3000 Client, and then dial the access code + called number on OpenEye.

1) If the system does not prompt wrong number and messages interacted between TCAP and User can be traced, such as TC_INVOKE_REQ, TC_CONTINUE_REQ, TC_INVOKE_IND, and TC_CONTINUE_IND, it indicates that the SoftX3000 can trigger the IN service successfully.

2) If the system prompts wrong number, use **LST SOCF** to check if the parameter "String of card flag" is set correctly, and then use **LST SIPTG** to check if the parameter "Remote URI" is set to the IP address of the IFMI of the local office, and finally use **LST RT**, **LST SRT**, and **LST SIPTG** to check if the mapping between route numbers, sub-route numbers, and trunk group numbers is correct.

3) If the SoftX3000 cannot trace the interaction messages between TCAP and a User, it indicates that SoftX3000 cannot trigger the IN service. Use the **LST CNACLD** command to check whether the service type of the prefix 230 is set to "intelligent service" and whether the service attribute, the minimum number length, and the maximum number length of the prefix are configured correctly.

III. Checking whether the call can be successfully connected (connection stage)

The anonymous card number service in one-stage dialing mode has no interaction stage, so the SoftX3000 directly connects a call after triggering the IN service. In normal cases, after a subscriber finishes typing/dialing a called number, the SoftX3000 connects the called subscriber immediately.

If the called subscriber cannot be connected and such error messages as "TC_U_ERROR_IND" are contained in the traced messages, it means that the service interconnection between the SoftX3000 and the SCP is abnormal. In this case, you can execute **LST ACCODE**, **LST TDPCFG**, **LST SCPADDR**, **LST SSPADDR**, and **LST SCPCFG** in turn at the SoftX3000 side to check whether the access code, DP number,

service key, DPC of SCP, and SCP corresponding to the service key are set correctly. If these data are correct at the SoftX3000 side, confirm if the data configuration at the peer SCP is correct.

IV. Checking whether IN services are charged normally

According to the charging classes defined in the system, originate each type of call on a phone set for testing purposes and then query the balance in the card number to check whether the IN services are charged normally.

1) If a call is charged incorrectly, use the **LST CHGCLS** command to check whether charging class parameters are configured correctly, such as TA charge rate, PB independent tariff, initial metering time interval, initial metering pulse count, metering time interval, and metering pulse count.

2) If a call cannot be charged, check with the SCP side whether charging class parameters are configured completely and consistently at both sides.

4.11 Configuring RACF Card Number

4.11.1 Introduction

I. Service description

The RACF card number is provided by the SoftX3000 through its embedded SCP feature. An RACF card number consists of two parts—SSP side data and embedded SCP data. The former defines DP number, service key, and the physical address of SSP and SCP. The latter defines service information related to CSP service and configuration information of RACF card number.

II. Implementation requirements

It is required that by defining 1000 RACF card numbers in the SoftX3000, when any local user dials the service key 17000, the user can complete the RACF service according to the announcement.

4.11.2 Script

I. Configuring DP data

//Add call prefix 17000 of RACF service (card number).

```
ADD  CNACLD:  PFX=K'17000,  CSTP=IN,  CSA=INSVR,  MINL=5,  MAXL=5,  CHSC=0,
SDESCRIPTION="RACF Service";
```

📖 Note:

- For the RACF service, the service category for the call prefix must be set to "intelligent service".
- Because the RACF service adopts the dual-stage dialing mode, the minimum number length and the maximum number length for the call prefix are both defined as the length of the access code (3 in this example). The service attribute is set to "intelligent service".

// Add access code descriptions. The access code for the RACF service is 17000.

```
ADD ACCODE: CODE=K'17000, POS=255, DBLEN=255;
```

//Add TDP configurations. The service key for the RACF service is 170.

```
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'17000, SKEY=170, CALLSRC=0;
```

📖 Note:

- For the RACF service, the SSP employs the "analysis information" call model, that is, the DP number is 3.
- For the RACF service, access code is usually used as the detection criterion of the DP 3, that is, the DP criteria is set to "access code".

II. Configuring SCP and SSP data

//Add the SCP physical address description. The SCP number is 0. The DPC is 001122 (which can be set as you like), and the SCP connect type is "Connect CSP".

```
ADD SCPADDR: SCP=0, DPC="001122", SCT=CSP;
```

📖 Note:

When SoftX3000 is interconnected to the embedded SCP, that is, when it is required to deploy the RACF service in the local office, the SCP number must be set to 0, and the SCP connect type must be set to "Connect CSP". Otherwise, the RACF service cannot be used normally.

//Add the SSP physical address description. The SCP number is 0. The DPC of the SSP (that is, SoftX3000) is 001122.

```
ADD SSPADDR: SCP=0, DPC="001122";
```

//Add SCP configurations. The INAP messages regarding the RACF service (with the service key 170) are processed by SCP0.

```
ADD SCPCFG: SKEY=170, DB=65535, SCP0=YES, SNAME=PPS;
```

III. Configuring IN announcement data

//Add language kind indexes. When the language position is 14, the corresponding language kind is ENG (English). When the language position is A0, the corresponding language kind is CHI (Chinese).

```
ADD LKNDIDX: SKEY="FC", IDX="14", KIN1=ENG;
ADD LKNDIDX: SKEY="FC", IDX="A0", KIN1=CHI;
```

 Note:

- The "service key" parameter in the command specifies the type of IN service to which the announcement in the recorded announcement message ID belongs. The parameter service key used here is different from the "service key" term used in IN services.
- For the RACF service, this parameter is set to "FC".

IV. Configuring RACF card number data

//Add IPN service configuration information. The service key is 170, the access code is 17000, the service type is "RACF service", and the charging type is "Period".

```
ADD CSPSRVC: SK=170, AC=K'17000, ST=RACF, CT=BACK;
```

 Note:

- You have to select "RACF service" for service type.
- The "service serial No." parameter in the command has a default value "FC". It is one of interconnection parameters between the embedded SCP and the SSP. It defines the service key in the recorded announcement message ID sent by the embedded SCP to the SSP through an INAP message to instruct the SSP to correctly operate the RACF service announcements on the MRS.

//Load the RACF service logic file. The service name is racf. The service file name is racf.bin.

```
ADD CSPSRVF: SRVNAME="racf", FILENAME="racf.bin";
```

📖 **Note:**

The racf.bin file provided by Huawei is stored on D:\data on the BAM hard disk.

//Activate the CSP service logic file. The service name is RACF.

```
ACT CSPSRVF: SRVNAME="racf";
```

// Add CSP service module configuration. The service key is 170, the FCCU module number is 22 and 23(configured in module1 and module2).

```
ADD CSPSRVM: SKEY=170, MDLFT=22, MDLSN=23;
```

//Add an RACF card number segment. The card number capacity is 1000.

```
ADD RACFSEG: SOUN=K'10000000, EOUN=K'10000999;
```

📖 **Note:**

● SoftX3000 can provide 9999 RACF card numbers currently. Pay attention to this limit when adding the IPN card number segment.
● SoftX3000 restricts the length of an RACF card number to 8 to 16 digits by default.

//Add RACF card numbers (for example purpose only)

```
ADD RACF: RACFNO=K'10000000, PWD=K'123456;
ADD RACF: RACFNO=K'10000001, PWD=K'123456;
ADD RACF: RACFNO=K'10000002, PWD=K'123456;
ADD RACF: RACFNO=K'10000003, PWD=K'123456;
ADD RACF: RACFNO=K'10000004, PWD=K'123456;
ADD RACF: RACFNO=K'10000005, PWD=K'123456;
ADD RACF: RACFNO=K'10000006, PWD=K'123456;
ADD RACF: RACFNO=K'10000007, PWD=K'123456;
ADD RACF: RACFNO=K'10000008, PWD=K'123456;
ADD RACF: RACFNO=K'10000009, PWD=K'123456;
```

4.11.3 Commissioning Guideline

I. Checking whether SoftX3000 can normally trigger CSP service

Start "CSP" in the interface tracing task on the SoftX3000 client, and then dial the RACF service access code 17000 on a phone set.

- If the system does not prompt number errors and interaction messages between the INSM and the CSP and interaction messages between the CSP and the CDB can be traced, such as INSM_TO_CSP, CSP_TO_INSM, CSP_TO_CDB, and CDB_TO_CSP, it indicates that SoftX3000 can normally trigger the CSP service.

- If the system prompts a number error or the interaction messages between the INSM and the CSP or between the CSP and the CDB cannot be traced, it indicates that SoftX3000 cannot trigger the IPN service. Use the **LST CNACLD** command to check whether the service category of the prefix 17000 is set to "intelligent service" and whether the service attribute, the minimum number length, and the maximum number length of the prefix are configured correctly.

II. Checking whether the embedded SCP can correctly instruct SoftX3000 to play recorded announcements and collect dialed digits

After SoftX3000 triggers a CSP service, SoftX3000 and the embedded SCP enter the interaction stage. Continue to observe the traced messages by "CSP".

- If the system correctly plays appropriate recorded announcements depending on the logics defined in the RACF service and prompts you to select a language, input card number and password, and input a called number, it indicates that the embedded SCP can correctly instruct SoftX3000 to play announcements and collect dialed digits.

- If IA_Error is found from the traced messages, it indicates that the service interconnection between SoftX3000 and the embedded SCP is abnormal. Use **LST ACCODE**, **LST TDPCFG**, **LST SCPADDR**, **LST SSPADDR**, and then **LST SCPCFG** to check whether the access code, the DP number, the service key, and the SCP number corresponding to the service key are configured correctly at the SSP side. If no data configuration errors are found at the SSP side, use **LST SRVCINF** and then **LST SRV** to check whether the service key, the access code, the service type, and the IPN service logic file are configured correctly at the SCP side and whether the IPN service logic file has been activated.

- If IA_Error is not included in the traced messages but the system cannot normally play recorded announcements yet, use **LST LANGKIND** and **LST LANGKINDIDX** to check whether the language kind, the service key, and the language position are configured correctly. If the preceding parameters are configured correctly, check whether MRS data is configured correctly and whether related voice files are loaded to the MRS successfully.

4.12 Configuring NP Service Data (HK)

4.12.1 Introduction

I. Service description

The NP service is generally provided as "SoftX3000 + NP server" in Hong Kong. The NP server is usually substituted by a SoftX3000 BAM. In actually networking, each local office is equipped with an NP server, storing the mapping data between the NP number and NN number of the local NP users.

II. Implementation requirements

Assume that the numbering plan of a local office is 6540****, 6541****, 6542****, and 6543****. It is required that by configuring the data in the SoftX3000, all users in the local office can apply and use the NP service.

4.12.2 Script

I. Configuring NP server data

//Add an NP server. The NP server index is 0.

```
ADD NP: NPI=0, NPN="NP server", IP1="172.20.200.0", IP2="172.30.200.0";
```

📖 **Note:**

- The IP address of link 1 must be in the segment of 172.20.xxx.xxx. Because a BAM is used as an NP server, the IP address of the link 1 can only be 172.20.200.0.
- The IP address of link 2 must be in the segment of 172.30.xxx.xxx. Because a BAM is used as an NP server, the IP address of the link 2 can only be 172.30.200.0.

//Add communication connections between the FCCU module and the NP server

```
ADD NPCON: MID=22, NPI0=0;
ADD NPCON: MID=23, NPI0=0;
ADD NPCON: MID=24, NPI0=0;
ADD NPCON: MID=25, NPI0=0;
```

📖 **Note:**

A subscriber cannot dial NP number until the operator has configured the communication connection between the NP server and the FCCU/FCSU module to which the subscriber belongs. Therefore, in actual deployment, you (operator) have to add communication connections from the NP server to all FCCU/FCSU modules.

II. Configuring number analysis data

//Modify the call source code of a local subscriber. The call source code is 0.

```
MOD CALLSRC: CSC=0, CLDNPFLG=YES;
```

📖 **Note:**

To enable the NP service, you have to set the HongKong NP flag of the call source code of all local subscribers to "True".

//Modify the attribute of the call source code 10 to which an incoming trunk belongs.

```
MOD CALLSRC: CSC=10, CLDNPFLG=YES;
MOD CALLSRC: CSC=20, CLDNPFLG=YES;
```

📖 **Note:**

When the peer office has no NP service analysis procedure for a certain call prefix in an incoming trunk call, while the local office shall start the analysis procedure, you have to set the HongKong NP flag of the call source code of the incoming trunk call to "True".

//Modify called number analysis for call prefix 6540, 6541, 6542, and 6543. The NP query start length is 8.

```
MOD CNACLD: LP=0, PFX=K'6540, NPSL=8;
MOD CNACLD: LP=0, PFX=K'6541, NPSL=8;
MOD CNACLD: LP=0, PFX=K'6542, NPSL=8;
MOD CNACLD: LP=0, PFX=K'6543, NPSL=8;
```

  📖 **Note:**

Because the callees with these call prefixes are all enabled with the NP service, the NP
start query length must be set to the actual length of the NP number. Here it is set to 8.

III. Configurations in Business Hall

//Park the subscriber but reserve the applied NP number.

```
PKR SBR: SDN=K'65400000, LP=0;
```

  📖 **Note:**

- After running **PKR SBR**, the system will successfully releases the port resources
  occupied by the NP number 65400000.
- When a subscriber applies the NP service, he will occupy two PSTN numbers in the
  local network.

//Log in the maintenance interface of the NP server, and add the mapping between the
NP number and NN (TN) number.

4.12.3 Commissioning Guideline

After finishing the above data configuration procedures, proceed as follows to verify the
service settings:

I. Check the connection between FCCU modules and the NP server

Use the command **DSP NPCON** to query the status of the connection between the
FCCU modules and the NP server. If the status is abnormal, proceed as follows:

1)   Use **LST NP** to check IP addresses of the link 1 and the link 2 are correct. They
     should be the same as the IP address of the NP server (BAM).
2)   Use **LST NPCON** to check whether there are connections configured between the
     FCCU modules and the NP server.

II. Dial the NP number to test the service

Assume that a subscriber has an NP number 65400000 and TN number 87801234.
The SoftX3000 will automatically transfer the calls to 65400000 from any subscriber or
incoming trunk in the local office to the number 87801234. If the call cannot be put
through, proceed as follows:

1) Use **LST CALLSRC** to check whether the "NP analysis flag" of the call source code is set to "True".

2) Use **LST CNACLD** to check whether the "NP query start length" of the NP number is set to the actual length of the NP number.

4.13 Configuring Collect Call Service

4.13.1 Introduction

I. Typical networking model

The collect call service is a service used in Brazil in which the payment is made by the called party. The basic call procedure is as follows:

1) The caller dials "access code + callee number".

2) When the called picks up, the local office at callee side shall play an announcement to both the caller and the caller, clarifying that the call is a collect call and is paid by the callee.

3) If the callee does not want to start the call, he can hang up in 12 seconds. Then the call is released and neither party shall pay for the call. If the callee wants to start the call and waits for the softswitch to connect the call, the charge will be covered by the callee.

It is crucial to configure the charging data of all offices involved in a collect call. There are two typical call models for collect call: the caller and callee belong to the same office, or belong to different offices. Figure 4-6 shows the call models.
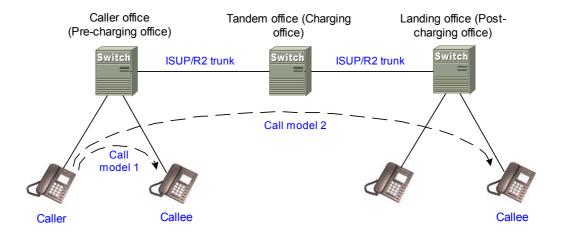
Figure 4-6 Typical networking model of a collect call

Here we introduce three charging-related terms in the collect call service:

- Pre-charging office: The office that initiates the collect call, or the caller office.

- Charging office: The (tandem or toll) office that complete the charging process.
- Post-charging office: The office that terminates the collect call, or the landing office.

In call model 1 of Figure 4-6, the caller office is the charging office. In call model 2, the caller office is the pre-charging office, the tandem office is the charging office, and the landing office is the post-charging office.

II. Implementation requirements

Assume that the SoftX3000 is used as a local office in a local network. The SoftX3000 can be a caller office or a landing office in a collect call. We will configure the collect call service data in the SoftX3000 for the two call models.

4.13.2 Script

I. Configuring charging data

//Modify software parameter P141

```
MOD FSFP: ID=P141, VAL="FFFD";
```

📖 Note:

Generally, the charging case is not used to determine whether the local office is a charging office. When there are subscribers or incoming trunks calling the collect call service prefix, the system renders the local office as the charging office by default. To use the charging case to determine the charging office, you have to set the bit1 of the call internal parameter (P141) to 0.

//Add a charging case 91 for the charging office, 92 for the pre-charging office, and 93 for the post-charging office in a collect call.

```
ADD CHGANA: CHA=91, CHGT=DETAIL, CBF=BP;
ADD CHGANA: CHA=92, CHGT=DETAIL, CBF=BBP1;
ADD CHGANA: CHA=93, CHGT=DETAIL, CBF=BBP2;
```

📖 Note:

The "confirm bill flag" parameter in the command defines the charging attributes of a collect call. Please configure it correctly.

//Modify charging mode.

```
MOD CHGMODE: CHA=91, DAT=NORMAL, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=91, DAT=DTYPE1, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=91, DAT=DTYPE2, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=92, DAT=NORMAL, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=92, DAT=DTYPE1, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=92, DAT=DTYPE2, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=93, DAT=NORMAL, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=93, DAT=DTYPE1, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=93, DAT=DTYPE2, TS1="00&00", TA1="60", PA1=1, TB1="60", PB1=1,
AGIO1=100, TS2="00&00";
```

//Add the charging case index for the destination code of collect call service.

```
ADD CHGIDX: CHSC=91, RCHS=254, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=91;
ADD CHGIDX: CHSC=92, RCHS=254, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=92;
ADD CHGIDX: CHSC=93, RCHS=88, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=93;
ADD CHGIDX: CHSC=93, RCHS=254, LOAD=ALL, BT=ALLBT, CODEC=ALL, CHA=91;
```

📖 **Note:**

- In the first command, the caller charging source code is 254 (wildcard), the charging case is 91. When a local subscriber dials "access code + local callee number", the charging selection code 91 is used for charging office (local office).
- In the second command, the caller charging source code is 254 (wildcard), the charging case is 92. When a local subscriber dials "access code + callee number", and the callee is not in the local office, the local office is the pre-charging office. The charging case is 91, and the charging selection code 92 is used for pre-charging office (local office).
- In the third command, the caller charging source code is 88 (for local incoming trunks), the charging case is 93. When a local incoming trunk call is from a collect call service subscriber of the local office, the charging selection code 91 is used for post-charging office (local office).
- In the fourth command, the caller charging source code is 254 (wildcard), the charging case is 91. When a local subscriber dials "access code + local callee number", the SoftX3000 removes the access code and re-analyzes the number. The charging selection code 93 is used for charging office (local office).

II. Configuring number analysis data (call model 1, callee in local office)

//Add a collect call service prefix. The access code is 90, and the callee is a local subscriber.

```
ADD  CNACLD:  PFX=K'90878,  CSA=LCT,  RSC=0,  MINL=5,  MAXL=9,  CHSC=92,
SDESCRIPTION="Collect Call";
ADD  CNACLD:  PFX=K'90895,  CSA=LCT,  RSC=0,  MINL=5,  MAXL=9,  CHSC=92,
SDESCRIPTION="Collect Call";
```

//Add a collect call service prefix. The access code is 90, and the callee is a national subscriber.

```
ADD  CNACLD:  PFX=K'900755,  CSA=LCT,  RSC=0,  MINL=5,  MAXL=24,  CHSC=92,
SDESCRIPTION="Collect Call";
ADD  CNACLD:  PFX=K'900756,  CSA=LCT,  RSC=0,  MINL=5,  MAXL=24,  CHSC=92,
SDESCRIPTION="Collect Call";
```

 Note:

- When a local subscriber dials "access code + callee number", and the callee is not in the local office, the local office is the pre-charging office. Therefore, the "service attribute" parameter shall be set to "Local toll" or "National toll", and the charging selection code shall be set to 92. The relevant charging case is 92.
- When the local office is a pre-charging office in a collect call, it generally does not make any special processing to the collect call service prefix. The access code of the prefix will be removed at the charging office (tandem or toll office).

III. Configuring number analysis data (call model 2, callee in local office)

//Add call prefix for local subscriber. The call prefixes are 6540 and 6541, and the charging selection code is 93 for both call prefixes.

```
ADD CNACLD: PFX=K'6540, MINL=7, MAXL=7, CHSC=93, SDESCRIPTION="Office_6540";
ADD CNACLD: PFX=K'6541, MINL=7, MAXL=7, CHSC=93, SDESCRIPTION="Office_6541";
```

 Note:

When the local office is the post-charging office in a collect call, the charging office (tandem or toll office) has removed the access code from the dialed number. When a local incoming trunk call calls a local collect call subscriber, the system will choose the charging case (93 in the example) based on the caller charging source code of the incoming trunk (for instance, 88) and the charging selection code of the prefix (for instance, 93).

//Add collect call service prefix. The access code is 90, and the callee is a local subscriber.

```
ADD   CNACLD:   PFX=K'906540,   CSA=SCCA,   MINL=5,   MAXL=7,   CHSC=91,
SDESCRIPTION="Collect Call";
ADD   CNACLD:   PFX=K'906541,   CSA=SCCA,   MINL=5,   MAXL=7,   CHSC=91,
SDESCRIPTION="Collect Call";
```

 Note:

When a local subscriber dials "access code + local callee number", the local office is the charging office. Therefore, the service attribute must be set to "collect call", and the charging selection code to 91. The relevant charging case is 91, used for the charging office.

//Add number change. The number change index is 91.

```
ADD DNC: DCX=91, DCT=DEL, DCP=0, DCL=2;
```

 Note:

- The result of the command is that the system remove digit 0 to digit 0 of the original number.
- When a local subscriber dials "access code + local callee number", the local office is the charging office. You need to remove the access code from the dialed number.

//Add prefix processing. Remove the access code of the call prefixes 906540 and 906541, and re-analyze the number.

```
ADD PFXPRO: CSC=65534, PFX="906540", CCF=YES, DDCX=91, ISREANA=YES;
ADD PFXPRO: CSC=65534, PFX="906541", CCF=YES, DDCX=91, ISREANA=YES;
```

 Note:

- The call source code 65534 is a wildcard. It means all call source codes.
- After removing the access code 90 from the call prefix 906540 and 906541, the system will decide the charging case (91 in the example) based on the caller charging source code (254 in the example) and charging selection code of the call prefixes without access code (for instance, 93).

//Modify the call-in authority of the local subscriber. Enable the collect call service with customized call-in authority 9.

```
MOD VSBR: D=K'6540000, LP=0, ICR=CCO9-1;
MOD VSBR: D=K'6540001, LP=0, ICR=CCO9-1;
```

 Note:

When the callee is a defaulting subscriber, or does not have customized call-in authority 9, or its charging category is "immediate subscriber table", he cannot use the collect call service. When a subscriber dials the "access code + callee number" the system will reject the call, and the caller will hear busy tone or the announcement "the callee has no authority.

//Modify the internal timer for announcement (optional). The default value is 12 seconds. Change it to 6 seconds.

```
MOD ITIMER: PID=120, YWLX=0, SEQ=49, NVL=6;
```

 Note:

- When the announcement is played, and any party hangs up, the charging office will generate a collect call bill, and the call duration is 0. If the callee accepts the collect call and either party hangs up after the call, the office will also generate a collect call. The call duration is from the end of announcement till either party hangs up.
- In any collect call, a pre-charging office or a post-charging office will always generate a collect call bill. By default, the free_indicator is set to 0 (free of charge). The call duration is from the start of announcement till either party hangs up.

4.13.3 Commissioning Guideline

I. Preparations

Before commissioning the collect call service, complete the configuration and commissioning of relevant subscriber access data and trunk networking data. Refer to chapter 1, "Subscriber Access Networking" and chapter 2, "Trunk Signaling Networking".

II. Dial test (callee not in local office)

Dial 908780000 on a local subscriber phone set. The callee hears the ringing and picks up. The landing office shall play the announcement to both the caller and the callee that the call is a collect call.

- If the system prompts that the number is incorrect after the caller finishes dialing, contact the maintenance engineers of the tandem office to check whether the tandem office has remove the access code from the call prefix 90878.

- If the system prompts that the call is restricted after the caller finishes dialing, contact the maintenance engineers of the landing office to check whether the subscriber 8780000 is enabled with collect call service.

III. Dial test (callee in local office)

Dial 908780000 on a local subscriber phone set. The callee hears the ringing and picks up. The landing office shall play the announcement to both the caller and the callee that the call is a collect call.
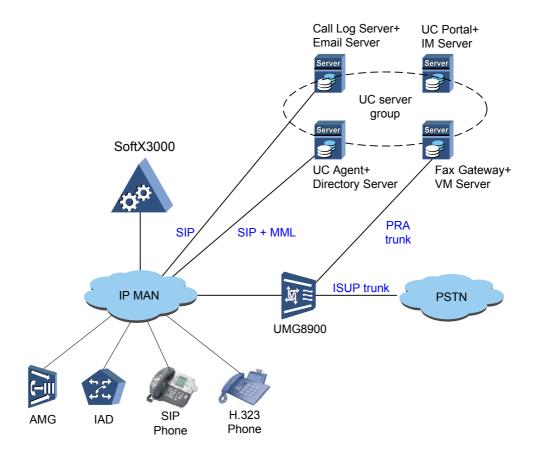
- If the system prompts that the number is incorrect after the caller finishes dialing, use **LST CNACLD** to check whether the service attribute of the prefix 906540 is "Collect call".
- If the system prompts that the call is restricted after the caller finishes dialing, use **LST VSBR** to check whether the subscriber 6540000 has customized call-in authority 9.

4.14 Configuring UC Service

4.14.1 Introduction

I. Typical networking model

The unified communication (UC) system integrates communication networks with the Internet. Based on the Huawei U-SYS solution, the UC system is composed of SoftSwitch network and UC server group. The typical networking model (based on the Microsoft's IT system) for the UC system connecting 20,000 subscribers is as follows:

Figure 4-7 Typical networking model for the UC system (connecting 20000 subscribers)

In Figure 4-7, to achieve correct interconnection between SoftX3000 and the UC server group, you need to configure the following data at SoftX3000 side:

- Interconnection data between SoftX3000 and UC Agent, between SoftX3000 and Call Log Server.
- Interconnection data between SoftX3000 and UMG8900 (provided with built-in signaling gateway function).
- Interconnection data between SoftX3000 and Fax Gateway.
- Interconnection data between SoftX3000 and VM Server.

II. Implementation requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

- SoftX3000 and the UC server group cooperate to provide such UC services as click to dial (CTD), click to fax (CTF), click to conference (CTC), and Presence.
- Two IUA links are set up between SoftX3000 and UMG8900, and they carry DSS1 signaling traffic in load sharing mode.
- SoftX3000 sets up four E1 circuits to Fax Gateway through UMG8900, corresponding to PRA links numbered 0, 1, 2, and 3.

- SoftX3000 sets up four E1 circuits to VM Server through UMG8900, corresponding to PRA links numbered 4, 6, 6, and 7.

III. Interconnection parameters

Before configuring data at SoftX3000 side, negotiate the following interconnection parameters with the UC server group and UMG8900, as shown in Table 4-14, Table 4-15, Table 4-16 and Table 4-17.

Table 4-14 Interconnection parameters between SoftX3000 and UC Agent as well as SoftX3000 and Call Log Server

Serial No.	Parameter	Value
1	IP address of SoftX3000	191.169.150.30/255.255.0.0
2	IP address of the UC Agent server	191.169.150.201/255.255.0.0
3	IP address of the Call Log Server	191.169.150.202/255.255.0.0
4	Number of UC subscriber	8780001–8780004

Table 4-15 Interconnection parameters between SoftX3000 and UMG8900

Serial No.	Parameter	Value
1	Control protocol used between SoftX3000 and UMG8900	H.248
2	H.248 code type	ASN.1 (binary format)
3	IP address of SoftX3000	191.169.150.30/255.255.0.0
4	IP address of UMG8900 in H.248	211.169.150.89/255.255.0.0
5	IP address of UMG8900 in SIGTRAN	211.169.150.90/255.255.0.0
6	Local UDP port number of H.248 at SoftX3000 side	2944
7	Local UDP port number of H.248 at UMG8900 side	2944
8	Voice codec types supported by UMG8900	G.711A, G.711③, G.723.1 and G.729A
9	Whether UMG8900 supports hairpin connection	Supported
10	Whether UMG8900 supports echo cancellation (EC) function	Supported
11	Whether UMG8900 supports T.38 protocol	Supported
12	Numbering plan for E1s at UMG8900	Starting from 0

Serial No.	Parameter	Value
13	Numbering plan for termination IDs (E1 timeslots) at UMG8900	Starting from 0
14	E1 numbers in PRA trunk group at SoftX3000 side	16－23
15	Corresponding E1 identifiers in PRA trunk group at UMG8900	0－7
16	Local stream control transmission protocol (SCTP) port number for IUA link at SoftX3000 side (client)	IUA link 0: 9900 IUA link 1: 9901
17	Local SCTP port number for IUA link at UMG8900 side (server)	9900
18	Traffic transmission mode of IUA links between SoftX3000 and UMG8900	Load sharing mode
19	Interface identifiers (integer) of PRA link 0 to PRA link 3	10000, 10001, 10002, 10003
20	Interface identifiers (integer) of PRA link 4 to PRA link 7	10004, 10005, 10006, 10007

Table 4-16 Interconnection parameters between SoftX3000 and Fax Gateway

Serial No.	Parameter	Value
1	E1 numbers of PRA trunk groups at SoftX3000 side	16－19
2	DSS1 type at SoftX3000 side	Network side
3	DSS1 type at Fax Gateway side	Subscriber side
4	PRA circuit number (at SoftX3000 side)	Link 0: 528 Link 1: 560 Link 2: 592 Link 3: 624
5	Termination IDs of PRA link numbers (at UMG8900 side)	Link 0: 16 Link 1: 48 Link 2: 80 Link 3: 112
6	Access code of fax gateway service	96167

Table 4-17 Interconnection parameters between SoftX3000 and VM Server

Serial No.	Parameter	Value
1	E1 numbers of PRA trunk groups at SoftX3000 side	20－23
2	DSS1 type at SoftX3000 side	Network side

Serial No.	Parameter	Value	
3	DSS1 type at VM Server side	Subscriber side	
4	PRA circuit number (at SoftX3000 side)	Link 4: 656	Link 5: 688
		Link 6: 720	Link 7: 752
5	Termination IDs of PRA link numbers (at UMG8900 side)	Link 4: 144	Link 5: 176
		Link 6: 208	Link 7: 240
6	Access code of voice mailbox service	96166	

4.14.2 Script

If the "forwarding to voice mailbox" service and the "enterprise fax server" service are not needed, it is only necessary to configure the UC service data.

I. Configuring UC data

//Add a pair of UCSI boards. Set "module number" to "101".

```
ADD BRD: FN=1, SN=2, LOC=FRONT, BT=UCSI, MN=101, ASS=3;
```

//Modify code of call source to which local subscribers belong. Set "Call source code" to "0".

MOD CALLSRC: CSC=0, UCFLAG=YES;

 Note:

If the carrier needs to enable UC services, you need to set "UC analysis flag" of the call source (to which local subscribers or incoming trunks belong) to "True".

//Add a UC agent server. Set "Agent server group number" to "10", "IFMI/MSGI module number" to "211", "Heartbeat test module number" (that is, UCSI module number) to "101".

```
ADD UCA: UCG=10, IFM/MID=211, UCA="191.169.150.201", LOG="191.169.150.202",
UCS=101;
```

📖 **Note:**

A SIP trunk is used to interconnect the SoftX3000 with the UC agent server. The SoftX3000 sends heartbeat signals to the UC agent server to prevent the SIP trunk from being down when the network is disconnected.

//Add an application server. Set "Application server group number" to "20" and "Server typ" to "Coloring ring back tone".

```
ADD APS: IAPPSERVER_GROUP=20, SRVFLAG=CRING-1, SPFX="205";
```

📖 **Note:**

Different from normal IN services, the ONLY plus color ring back tone service is triggered by AS (for example, the U-NICA of Huawei) that controls its service logics. You only need to enter the corresponding access code at SoftX3000 side and route the service to the corresponding SIP trunk.

//Add three UC subscribers. Set "Original binding number type" to "Out office", "Local office", and "3G" respectively.

```
ADD USBR: UCNM=K'8780101, LP=0, MN=101, BINDTYPE=OUT, ORIDN=K'6660123,
UCGROUP=10, TRIGGERTYPE=ALL, CSC=0, RCHS=87;
ADD USBR: UCNM=K'8780100, LP=0, MN=101, BINDTYPE=LOCAL, ORIDN=K'6540000,
UCGROUP=10, TRIGGERTYPE=ALL, CSC=0, RCHS=87;
ADD USBR: UCNM=K'8780103, LP=0, MN=101, BINDTYPE=MB, ORIDN=K'13801234567,
UCGROUP=10, TRIGGERTYPE=ALL, CSC=0, RCHS=87;
```

//Add a workstation with IP address as 191.169.150.201 (that is, the IP address of UC Agent) and with command group as G_20.

```
ADD WS: WS="UC-Agent", IP="191.169.150.201", CG=G_20-1;
```

📖 **Note:**

To ensure the security of SoftX3000 terminals, you need to restrict the authority of the command group to which UC Agent belongs. It is recommended to set the command group of UC Agent to "G_20".

II. Configuring MG data

//Add a UMG8900 with equipment ID as "211.169.150.89:2944". The module Number of the FCCU is 23.

```
ADD MGW: EID="211.169.150.89:2944", GWTP=UMGW, MGWDESC="Shenzhen-UMG8900-06",
MGCMODULENO=23, LA="191.169.150.30", RA1="211.169.150.89", RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

III. Configuring IUA data

//Add a built-in SG in UMG8900 with SG ID as 6.

```
ADD ESG: SGID=6, SGNAME="IUA SG", EID="211.169.150.89:2944";
```

//Add an IUA linkset, with linkset index as 3, device type as PRA, interface ID type as integer.

```
ADD IUALKS: LSX=3, LSNAME="IUA LinkSet 3", TM=LOADSHARE, DT=PRA, IFT=INTEGER,
SGID=6;
```

//Add two IUA links, with SoftX3000 as the Client, the local SCTP port number of link 3 of module 136 as 9900, the local SCTP port number of link 3 of module 137 as 9901, and the peer SCTP port number as 9900 (default value).

```
ADD IUALNK: MN=136, LNKN=3, LSX=3, LOCPORT=9900, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.90";
ADD IUALNK: MN=137, LNKN=3, LSX=3, LOCPORT=9901, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.90";
```

 Note:

- The parameter "peer IP address" in this command must be set to the IP address of UMG8900 in SIGTRAN, that is, 211.169.150.90.
- If two BSGIs are configured in SoftX3000, it is recommended to configure the two IUA links in different BSGIs, so as to ensure the reliability of the IUA links. In this example, the first link is configured in module 136 and the second link is configured in module 137.

IV. Configuring PRA link data

//Add eight PRA links, with IUA linkset index as 2 and signaling type as DSS1 network side. The module Number of the FCCU is 23.

```
ADD PRALNK: PLN=12, SCN=528, MN=23, LKS=3, BINIFID=10000, SIGT=NET;
```

```
ADD PRALNK: PLN=13, SCN=560, MN=23, LKS=3, BINIFID=10001, SIGT=NET;

ADD PRALNK: PLN=14, SCN=592, MN=23, LKS=3, BINIFID=10002, SIGT=NET;

ADD PRALNK: PLN=15, SCN=624, MN=23, LKS=3, BINIFID=10003, SIGT=NET;

ADD PRALNK: PLN=16, SCN=656, MN=23, LKS=3, BINIFID=10004, SIGT=NET;

ADD PRALNK: PLN=17, SCN=688, MN=23, LKS=3, BINIFID=10005, SIGT=NET;

ADD PRALNK: PLN=18, SCN=720, MN=23, LKS=3, BINIFID=10006, SIGT=NET;

ADD PRALNK: PLN=19, SCN=752, MN=23, LKS=3, BINIFID=10007, SIGT=NET;
```

V. Configuring routing data

//Add two office directions, with the office direction to Fax Gateway numbered 81 and that to VM Server numbered 82.

```
ADD OFC: O=81, ON="Fax Gateway", DOT=CMPX, DOL=LOW, METHOD=NOCONV;

ADD OFC: O=82, ON="VM Server", DOT=CMPX, DOL=LOW, METHOD=NOCONV;
```

//Add two sub-routes, with the sub-route to Fax Gateway numbered 81 and that to VM Server numbered 82.

```
ADD SRT: SRC=81, O=81, SRN="To Fax Gateway", TSM=CYC;

ADD SRT: SRC=82, O=82, SRN="To VM Server", TSM=CYC;
```

//Add two routes, with the route to Fax Gateway numbered 81 and that to VM Server numbered 82.

```
ADD RT: R=81, RN="To Fax Gateway", SR1=81;

ADD RT: R=82, RN="To VM Server ", SR1=82;
```

//Add route analysis data, with route selection code to Fax Gateway as 16 and that to VM Server as 17.

```
ADD RTANA: RSC=16, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=81,
ISUP=NOCHG;

ADD RTANA: RSC=17, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=82,
ISUP=NOCHG;
```

VI. Configuring PRA subscriber data

//Add a number segment.

```
ADD DNSEG: LP=0, SDN=K'90000, EDN=K'99999;
```

//Add ISDN data with index as 2 and maximum B channel as 30.

```
ADD ISDNDAT: ISDNX=2, BCHN=30;
```

📕 **Note:**

For PRA subscribers, the parameter "maximum B channel" in the command must be set to 30.

//Add two PRA subscribers whose telephone numbers are 96166 and 96167 respectively. Set the route select code for 96166 to 16 and ISDN data index to 2, and set the route select code for 96167 to 17 and ISDN data index to 2. The module Number of the FCCU is 23.

```
ADD  PRA:  D=K'96166,  P=0,  RTSL=16,  ISDNX=2,  MN=23,  CSC=0,  RCHS=22,
NS=DDI-1&CLIP-1;
ADD  PRA:  D=K'96167,  P=0,  RTSL=17,  ISDNX=2,  MN=23,  CSC=0,  RCHS=22,
NS=DDI-1&CLIP-1;
```

VII. Configuring PRA trunk data

//Add eight PRA trunk groups. Trunk groups 160, 161, 162 and 163 are subject to the sub-route 81, whose default caller number is 96166; trunk groups 170, 171, 172 and 173 are subject to the sub-route 82, whose default caller number is 96167.

```
ADD PRATG: TG=160, MGW="211.169.150.89:2944", SRC=81, LINK=12, CDEF=K'96166,
TGN="To Fax Gateway";
ADD PRATG: TG=161, MGW="211.169.150.89:2944", SRC=81, LINK=13, CDEF=K'96166,
TGN="To Fax Gateway";
ADD PRATG: TG=162, MGW="211.169.150.89:2944", SRC=81, LINK=14, CDEF=K'96166,
TGN="To Fax Gateway";
ADD PRATG: TG=163, MGW="211.169.150.89:2944", SRC=81, LINK=15, CDEF=K'96166,
TGN="To Fax Gateway";
ADD PRATG: TG=170, MGW="211.169.150.89:2944", SRC=82, LINK=16, CDEF=K'96167,
TGN="To VM Server";
ADD PRATG: TG=171, MGW="211.169.150.89:2944", SRC=82, LINK=17, CDEF=K'96167,
TGN="To VM Server";
ADD PRATG: TG=172, MGW="211.169.150.89:2944", SRC=82, LINK=18, CDEF=K'96167,
TGN="To VM Server";
ADD PRATG: TG=173, MGW="211.169.150.89:2944", SRC=82, LINK=19, CDEF=K'96167,
TGN="To VM Server";
```

//Add PRA trunk circuits. The module Number of the FCCU is 23.

```
ADD PRATKC: MN=23, TG=160, SC=512, EC=543, TID=0;
ADD PRATKC: MN=23, TG=161, SC=544, EC=575, TID=32;
ADD PRATKC: MN=23, TG=162, SC=576, EC=607, TID=64;
ADD PRATKC: MN=23, TG=163, SC=608, EC=639, TID=96;
```

```
ADD PRATKC: MN=23, TG=170, SC=640, EC=671, TID=128;

ADD PRATKC: MN=23, TG=171, SC=672, EC=703, TID=160;

ADD PRATKC: MN=23, TG=172, SC=704, EC=735, TID=192;

ADD PRATKC: MN=23, TG=173, SC=736, EC=767, TID=224;
```

VIII. Configuring number analysis data

//Set the local office information. Set the access code for both "CFB to voice mailbox" and "CFNR to voice mailbox" to 96166.

```
SET OFI: OFN="SX3000", LOT=CMPX, NN=YES, SN1=NAT, SN2=NAT, SN3=NAT, SN4=NAT,
NPC="001122", NNS=SP24, SPF=YES, BTVM=K'96166, NTVM=K'96166;
```

 Note:

You must set the parameters "CFB to voice mailbox" and "CFNR to voice mailbox" in the local office information table; otherwise, these two services cannot be used.

//Add call prefix, with the access code for voice mailbox service as 96166 and that for fax GW service is 96167.

```
ADD CNACLD: PFX=K'96166, CSTP=ADD, CSA=LC, RSC=16, MINL=5, MAXL=12, CHSC=0,
SNO=4, DP=5, DT=3;
ADD CNACLD: PFX=K'96167, CSTP=ADD, CSA=LC, RSC=17, MINL=5, MAXL=12, CHSC=0,
SNO=4, DP=5, DT=3;
```

 Note:

● By taking the access code for voice mailbox service "96166" as an example, configure the key parameters as follows:

- For the voice mailbox service, set the parameter "service category" to "increment service" and "service sequence number" to "4".
- Because 96166 is an outgoing prefix, set the parameter "service attribute" to "local" but not "intra-office", and "route selection code" to "16" but not "65535".
- Set the parameter "minimum number length" to "5" (the length of the access code "96166"), and "maximum number length" to "12" (the length of access code + local subscriber number).
- The mailbox number can be dialed right after the access code for voice mailbox service. For example, when a subscriber dials "96166PQRABCD", he/she can enter the mailbox numbered "PQRABCD" directly. In addition, the subscriber can dial "96166" first, and then enter the mailbox following the voice prompt. This function is achieved by the cooperation of two parameters "time delay trigger point" and "triggering delay". Set "time delay trigger point" to " 5" (the length of the access code), indicating that the time delay timer is triggered after five digits are dialed. Set "triggering delay" to 3 seconds, indicating that if there are subsequent digits dialed within three seconds, they will be received also; otherwise, the five-digit number will be analyzed after timeout.

4.14.3 Commissioning Guideline

After completing the preceding configurations, verify the service following the steps below.

I. Checking whether the network connection is normal

Use the ping utility on the U-SYS SoftX3000 Client to check whether the network connection between SoftX3000 and each UC server is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP routing data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether the UMG8900 has been registered normally

Carry out the **DSP MGW** command on the U-SYS SoftX3000 Client to check whether the UMG8900 has been registered normally, and then decide the next steps according to the returned result.

- If "normal" is returned, it indicates that the UMG8900 has been registered and its data configuration is correct.
- If "disconnect" is displayed, it indicates that the UMG8900 has been registered but is out of service now. In this case, check whether the related data at either side has been modified.

- If "fault" is displayed, it indicates the gateway cannot be registered. In this case, use the **LST MGW** command to check whether the parameters, such as equipment ID, peer IP address, peer port number and code type, are correctly configured.

III. Checking whether the state of the IUA link is normal

Carry out the **DSP IUALNK** command on the U-SYS SoftX3000 Client to check whether the state of the related IUA link is normal. If the state is abnormal, use the **LST IUALKS** command to check whether the transmission mode of the linkset is configured correctly, and then use command **LST IUALNK** to check whether such parameters as local port number, local IP address, peer port number and peer IP address are correctly configured.

IV. Checking whether the state of the PRA link is normal

Carry out the **DSP PRALNK** command on the U-SYS SoftX3000 Client to check whether the state of the related PRA link is normal. If the state is abnormal, use the **LST PRALNK** command to check whether command parameters are configured correctly, such as module number, IUA linkset index, link number, interface identifier and signaling type.

V. Checking whether the state of the PRA trunk circuits is normal

Carry out the **DSP N1C** command on the U-SYS SoftX3000 Client to check whether the state of the related PRA trunk circuits is normal. If the state is abnormal, use the command **LST TG** or **LST TKC** to check whether command parameters are configured correctly, such as equipment ID, start circuit number, and start circuit termination ID.

VI. Checking whether UC services are normal

Refer to the operations described in *WorkSpace Unified Communication System User Manual* for instructions.

Chapter 5 Specialized Configurations

5.1 Configuring Clock Data

In the case that SoftX3000 provides message transfer part (MTP) links to connect the equipment in the Signaling System No. 7 (SS7) network such as Signaling Point (SP), Signaling Transfer Point (STP) and Service Control Point (SCP), configure clock data according to the clock networking model of SoftX3000 as well as hardware equipment such as Fixed Calling Control Unit and Signaling process Unit (FCSU), Clock Interface Unit (CKII) and E1_Pool Interface Unit (EPII). Otherwise, MTP links cannot work normally.

5.1.1 SoftX3000 Locking BITS Clock

I. Networking model

When a SoftX3000 office has Building Integrated Timing Supply (BITS) equipment installed, SoftX3000 can access reference clock signals of 2 MHz or 2 Mbit/s from the BITS equipment through external clock lines (connected to the BITS1 or the BITS2 interface on the CKIIs), as shown in Figure 5-1.
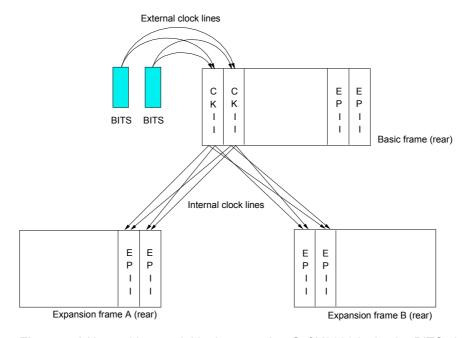
Figure 5-1 Networking model in the case that SoftX3000 locks the BITS clock

In SoftX3000, expansion frames access reference clock signals (of 8 kHz) from the CKIIs in the basic frame through internal clock lines. In each frame, the clock reference source of an EPII is decided by the actual hardware configuration. The following text is based on the networking model as shown in Figure 5-1.

1) For the basic frame, the EPIIs' clock reference sources are fixedly the CKII (active) in slot 13 and the CKII (standby) in slot 15.

2) For the expansion frame A, the EPIIs' clock reference sources are the EPII (active) in Slot 0 and the EPII (standby) in Slot 1.

3) For the expansion frame B, the EPIIs' clock reference sources are the EPII (active) in Slot 14 and the EPII (standby) in Slot 15.

II. Requirements

Configure clock data at the SoftX3000 side to enable EPIIs in the basic frame, expansion frame A and expansion frame B to synchronize the BITS clock.

III. Script

//Add shelves. Shelf 0 is the integrated configuration cabinet and Shelf 1 is the service configuration cabinet.

```
ADD SHF: SN=0, LT="Cabinet 0", PN=0, RN=0, CN=0, PL=2;
ADD SHF: SN=1, LT="Cabinet 1", PN=0, RN=0, CN=1, PL=3;
```

//Add frames. The number of the basic frame is 0, that of the expansion frame A is 2 and that of the expansion frame B is 3.

```
ADD FRM: FN=0, SN=0, PN=2;
ADD FRM: FN=2, SN=1, PN=0;
ADD FRM: FN=3, SN=1, PN=1;
```

//Add boards. Note that CKIIs can only be configured in Slots 13 and 15 in the basic frame (Frame 0).

```
ADD BRD: FN=0, SN=0, LOC=FRONT, BT=FCSU, MN=42, ASS=1, LNKT=LINK_64K;
ADD BRD: FN=0, SN=0, LOC=BACK, BT=EPII;
ADD BRD: FN=0, SN=1, LOC=BACK, BT=EPII;
ADD BRD: FN=0, SN=13, LOC=BACK, BT=CKII;
ADD BRD: FN=0, SN=15, LOC=BACK, BT=CKII;
ADD BRD: FN=2, SN=0, LOC=FRONT, BT=FCSU, MN=43, ASS=1, LNKT=LINK_64K;
ADD BRD: FN=2, SN=0, LOC=BACK, BT=EPII;
ADD BRD: FN=2, SN=1, LOC=BACK, BT=EPII;
ADD BRD: FN=3, SN=14, LOC=FRONT, BT=FCSU, MN=44, ASS=15, LNKT=LINK_64K;
ADD BRD: FN=3, SN=14, LOC=BACK, BT=EPII;
ADD BRD: FN=3, SN=15, LOC=BACK, BT=EPII;
```

//Add E1 port configuration.

```
ADD EPICFG: FN=0, SN=0, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF, E7=DF;

ADD EPICFG: FN=2, SN=0, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF, E7=DF;

ADD EPICFG: FN=3, SN=14, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF,
E7=DF;
```

📖 Note:

- When you add an E1 port on the EPII in the active slot, the system automatically adds an E1 port on the EPII in the standby slot. You need not configure it again.
- Keep E1 port configuration consistent with that at the opposite side. In this example, the E1 ports' frame format is set to "double frame" and balance mode is set to "non-balanced" (to connect 75-ohm coaxial cables).

//Set CKII clock with clock level as "level2", work mode as "auto", BITS1 clock source type as "CLK_2M", and BITS2 clock source type as "CLK_E1".

```
SET CKICFG: CL=LEVEL2, WM=AUTO, B1CST=CLK_2M, B2CST=CLK_E1;
```

📖 Note:

In this example, it is assumed that the BITS1 interface on the CKII accesses the 2-MHz reference clock signal and the BITS2 interface accesses the 2-Mbit/s reference clock signal.

//Set the clock sources of the EPIIs.

```
SET CLKSRC: FN=3, SN1=14, SN2=15;
```

📖 **Note:**

- For the basic frame, the EPIIs' clock sources are the active CKII in Slot 13 and the standby CKII in Slot 15 by default. The configuration is fixed and cannot be modified.
- For the expansion frame A, the EPIIs' clock sources are the active EPII in Slot 0 and the standby EPII in Slot 1 by default. The configuration is in accordance with the actual clock distribution and you need not modify it.
- For the expansion frame B, the EPIIs' clock sources are the active EPII in Slot 14 and the standby EPII in Slot 15 by default. The configuration is not in accordance with the actual clock distribution and you need modify it. Otherwise, the EPIIs will not be working normally.

IV. Commissioning guideline

After completing the preceding configurations, check the clock system following the steps below.

1)   Check the state of the clock Phase-Locked Loop (PLL) circuits on the CKIIs.

Carry out the **DSP CLKPH** command on the U-SYS SoftX3000 Client to check whether the clock PLL circuits on the CKIIs are normal.

- If the client displays "Trace Mode", it means that the clock PLL circuits can normally trace the BITS clock.
- If the client displays "Free Run", it means that the clock PLL circuits cannot normally trace the BITS clock. In this case, carry out the **LST CKICFG** command to check such parameters as clock level, work mode, BITS1 priority, BITS2 priority, BITS1 clock source type and BITS2 clock source type.

2)   Check the state of the clock of the EPIIs.
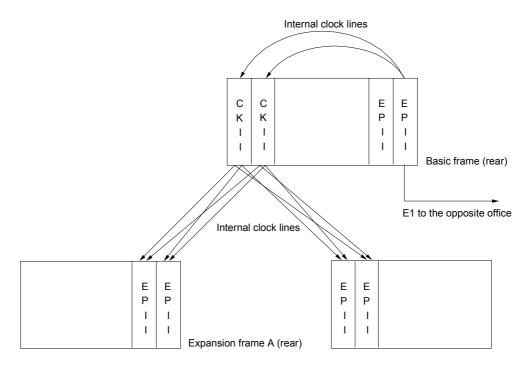
Carry out the **DSP CLKSTAT** command to query the state of the clock of the EPIIs which work as clock sources in expansion frames. If the clock is abnormal, carry out the following operations:

- Carry out the **LST CLKSRC** command to check the clock sources of each EPII.
- If clock data configuration is correct, check the clock distribution in SoftX3000.
- If both clock data configuration and clock distribution are correct, check whether the EPIIs which work as clock sources are working normally.

5.1.2 SoftX3000 Locking Clock of Opposite Office

I. Networking model

When a SoftX3000 office has no BITS equipment, the SoftX3000 can only extract the E1 line clock from the opposite office through its EPIIs and transmit the reference clock signals to the CKIIs through internal 2-Mbit/s clock lines (connected to LINE1 and LINE2 interfaces on the CKIIs), as shown in Figure 5-2.

Figure 5-2 Networking model in the case that SoftX3000 locks the clock of the opposite office

In Figure 5-2, it is assumed that the EPII in Slot 0 is the active board. The internal clock lines connecting CKIIs can only be from the EPII in Slot 0 because only the active EPII can output 2-MHz clock signal (can output only two channels). If the basic frame has four EPIIs, the two active EPIIs can provide four channels of 2-MHz clock signals to be connected to the active and standby CKIIs.

In SoftX3000, expansion frames access reference clock signals (of 8 kHz) from the CKIIs in the basic frame through internal clock lines. In each frame, the clock reference of the EPII is decided by the actual hardware configuration. The following text is based on the networking model as shown in Figure 5-1.

1) For the basic frame, the EPIIs' clock reference sources are fixedly the CKII (active) in Slot 13 and the CKII (standby) in Slot 15.

2) For the expansion frame A, the EPIIs' clock reference sources are the EPII (active) in Slot 0 and the EPII (standby) in Slot 1.

3) For the expansion frame B, the EPIIs' clock reference sources are the EPII (active) in Slot 14 and the EPII (standby) in Slot 15.

II. Requirements

Configure clock data at the SoftX3000 side to enable EPIIs in the basic frame, expansion frame A and expansion frame B to synchronize the clock of the opposite office.

III. Script

//Add shelves. Shelf 0 is the integrated configuration cabinet and Shelf 1 is the service configuration cabinet.

```
ADD SHF: SN=0, LT="Cabinet 0", PN=0, RN=0, CN=0, PL=2;
ADD SHF: SN=1, LT="Cabinet 1", PN=0, RN=0, CN=1, PL=3;
```

//Add frames. The number of the basic frame is 0, that of the expansion frame A is 2 and that of the expansion frame B is 3.

```
ADD FRM: FN=0, SN=0, PN=2;
ADD FRM: FN=2, SN=1, PN=0;
ADD FRM: FN=3, SN=1, PN=1;
```

//Add boards. Note that CKIIs can only be configured in Slots 13 and 15 in the basic frame (Frame 0).

```
ADD BRD: FN=0, SN=0, LOC=FRONT, BT=FCSU, MN=42, ASS=1, LNKT=LINK_64K;
ADD BRD: FN=0, SN=0, LOC=BACK, BT=EPII;
ADD BRD: FN=0, SN=1, LOC=BACK, BT=EPII;
ADD BRD: FN=0, SN=13, LOC=BACK, BT=CKII;
ADD BRD: FN=0, SN=15, LOC=BACK, BT=CKII;
ADD BRD: FN=2, SN=0, LOC=FRONT, BT=FCSU, MN=43, ASS=1, LNKT=LINK_64K;
ADD BRD: FN=2, SN=0, LOC=BACK, BT=EPII;
ADD BRD: FN=2, SN=1, LOC=BACK, BT=EPII;
ADD BRD: FN=3, SN=14, LOC=FRONT, BT=FCSU, MN=44, ASS=15, LNKT=LINK_64K;
ADD BRD: FN=3, SN=14, LOC=BACK, BT=EPII;
ADD BRD: FN=3, SN=15, LOC=BACK, BT=EPII;
```

//Add E1 port configuration.

```
ADD EPICFG: FN=0, SN=0, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF, E7=DF;
ADD EPICFG: FN=2, SN=0, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF, E7=DF;
```

```
ADD EPICFG: FN=3, SN=14, E0=DF, E1=DF, E2=DF, E3=DF, E4=DF, E5=DF, E6=DF,
E7=DF;
```

 📖 **Note:**

- When you add an E1 port on the EPII in the active slot, the system automatically adds an E1 port on the EPII in the standby slot. You need not configure it again.
- Keep E1 port configuration consistent with that at the opposite side. In this example, the E1 ports' frame format is set to "double frame" and balance mode is set to "non-balanced" (to connect 75-ohm coaxial cables).

//Add clock sources for desired boards.

```
ADD BOSRC: FN=0, SN=0, EN=0;
```

 📖 **Note:**

- Type only the slot number of the active EPII. However, for a pair of active and standby EPIIs, the slot number of the active board is not fixed and is specified by the **ADD EPICFG** command. That is, the slot number specified by the ADD EPICFG command is the slot number of the active board.
- The above command means that SoftX3000 will extract the E1 line clock of the opposite office through the E1 port 0 of the EPII board which is in Slot 0, Frame 0.

//Add clock configuration for the CKIIs: Set clock level to "level3" and work mode to "auto".

```
SET CKICFG: CL=LEVEL3, WM=AUTO;
```

 📖 **Note:**

In the case that the local office locks the clock of the opposite office, the clock level of the local office cannot be higher than that of the opposite office. If the clock level of the opposite office is level3 or higher, generally set the clock level of the local office to level3.

//Set the clock sources of the EPIIs.

```
SET CLKSRC: FN=3, SN1=14, SN2=15;
```

📖 **Note:**

- For the basic frame, the EPIIs' clock sources are the active CKII in Slot 13 and the standby CKII in Slot 15 by default. The configuration is fixed and cannot be modified.
- For the expansion frame A, the EPIIs' clock sources are the active EPII in Slot 0 and the standby EPII in Slot 1 by default. The configuration is in accordance with the actual network and you need not modify it.
- For the expansion frame B, the EPIIs' clock sources are the active EPII in Slot 14 and the standby EPII in Slot 15 by default. The configuration is not in accordance with the actual network and you need modify it. Otherwise, the EPIIs will not be working normally.

IV. Commissioning guideline

After completing the preceding configurations, check the clock system following the steps below.

1) Check the state of the E1 ports.

Carry out the **DSP PORT** command to check whether the E1 port on the EPII is normal through which the local office locks the E1 line clock of the opposite office. Only when the E1 port is in the "Normal" state can the EPII extracts the E1 line clock.

2) Check the state of the clock PLL circuits on the CKIIs.

Carry out the **DSP CLKPH** command to check whether the clock PLL circuits on the CKIIs are normal.

- If the client displays "Trace Mode", it means that the clock PLL circuits can normally trace the E1 line clock of the opposite office.
- If the client displays "Free Run", it means that the clock PLL circuits cannot normally trace the E1 line clock of the opposite office. In this case, first carry out the **LST BOSRC** command to check such parameters as frame number, slot number and E1 number. Then carry out the **LST CKICFG** command to check such parameters as clock level and work mode.

3) Check the state of the clock of the EPIIs.

Carry out the **DSP CLKSTAT** command to query the state of the clock of the EPIIs which work as clock sources in expansion frames. If the clock is abnormal, carry out the following operations:

- Carry out the **LST CLKSRC** command to check the clock sources of each EPII.
- If clock data configuration is correct, check the clock distribution in SoftX3000.
- If both clock data configuration and clock distribution are correct, check whether the EPIIs which work as clock sources are working normally.

5.2 Configuring Charging Data

5.2.1 Centralized Charging Data

I. Introduction

Centralized charging refers to the case that a higher-level office (transit office or toll office) charges all incoming trunk calls of the offices (end offices) in the local network. It applies only the "detailed ticket" charging method because it is impossible for the centralized charging office to obtain the meters of all covered subscribers.

In SoftX3000, centralized charging is based on trunk charging. It carries out charging analysis by using charging source codes of incoming trunks or those of calling parties' prefixes for distinctive charging.

Centralized charging is different from incoming trunk charging. In the case of the former, the SoftX3000 generates two bills, one trunk bill and one ordinary bill, while in the case of the latter, it generates only one trunk bill. For centralized charging, when the incoming trunk originates a call, the local office will request the caller number from the opposite office through the incoming trunk. Otherwise, the corresponding bill will have no caller number and cannot be sorted.

II. Example 1 (the local office is an end office)

Requirements: The toll office will charge all toll calls of the local office and the local office itself will not charge them.

//Add a charging case "100".

```
ADD CHGANA: CHA=100, PAY=NOCHG;
```

 Note:

If toll call prefixes have no charging case, SoftX3000 might generate a great many charging alarms. To avoid such case, it is recommended to add a charge case for the toll call prefixes and set the parameter "payer" to "no charge" although the local office does not charge toll calls.

//Modify charging modes.

```
MOD CHGMODE: CHA=100, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";
```

```
MOD CHGMODE: CHA=100, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=100, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add charging case indexes. Set charging selection code to "100", charging case to "100", and caller charging source code to "22", "33", "65" and "87" respectively (all for destination code charging of the subscribers of the local office).

```
ADD CHGIDX: CHSC=100, RCHS=22, LOAD=ALL, CODEC=ALL, CHA=100;
ADD CHGIDX: CHSC=100, RCHS=33, LOAD=ALL, CODEC=ALL, CHA=100;
ADD CHGIDX: CHSC=100, RCHS=65, LOAD=ALL, CODEC=ALL, CHA=100;
ADD CHGIDX: CHSC=100, RCHS=87, LOAD=ALL, CODEC=ALL, CHA=100;
```

 Note:

Because the payer of the charging case "100" is "no charge", the local office will not generate bills and charging alarms when its subscribers dial the toll call prefixes.

//Add ESL subscribers (applying charging source codes to subscribers).

```
ADB   VSBR:   SD=K'2220000,   ED=K'2220319,   LP=0,   MN=22,   DID=ESL,
EID="amg5320_22.com", STID=0, CODEC=PCMA, RCHS=22, NS=CLIP-1;
ADB   VSBR:   SD=K'3330000,   ED=K'3330319,   LP=0,   MN=22,   DID=ESL,
EID="amg5320_33.com", STID=0, CODEC=PCMA, RCHS=33, NS=CLIP-1;
ADB   VSBR:   SD=K'6540000,   ED=K'6540319,   LP=0,   MN=22,   DID=ESL,
EID="amg5320_65.com", STID=0, CODEC=PCMA, RCHS=65, NS=CLIP-1;
ADB   VSBR:   SD=K'8780000,   ED=K'8780319,   LP=0,   MN=22,   DID=ESL,
EID="amg5320_87.com", STID=0, CODEC=PCMA, RCHS=87, NS=CLIP-1;
```

//Add a call prefix (applying the charging selection code to a toll call prefix), with call prefix as "0" and charging selection code as "100".

```
ADD CNACLD: PFX=K'0, CSA=NTT, RSC=0, MINL=4, MAXL=24, CHSC=100;
```

III. Example 2 (the local office is a toll office)

Requirements: The local office charges the toll calls of all its end offices.

//Add a charging case "101".

```
ADD CHGANA: CHA=101, CHO=CENACC, CHGT=DETAIL;
```

 Note:

Because the local office will charge toll calls of lower-level offices, set the parameter "charging office" to "centralized charging" and "charging method" to "detailed ticket".

//Modify charging modes.

```
MOD CHGMODE: CHA=101, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=101, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=101, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
```

//Add charging case indexes, with charging selection code as "101", charging case as "101", and caller charging source code as "60" (for destination code charging of incoming trunk groups of lower-level offices).

```
ADD CHGIDX: CHSC=101, RCHS=60, LOAD=ALL, CODEC=ALL, CHA=101;
```

 Note:

It is recommended to apply the destination code charging mode for the case that the toll office charges lower-level offices. Thus, telecom carriers can adopt different charging strategies for different call prefixes.

//Modify the attributes of an incoming trunk group (taking the SS7 trunk group as an example to apply the charging source code to the incoming trunk group).

```
MOD N7TG: TG=31, RCHS=60, CAMA=YES;
```

 Note:

Because the local office will charge toll calls of lower-level offices, set the parameter "CAMA" to Yes and "charging source code" to the caller charging source code defined for the trunk group (that is, "60" here).

//Add a call prefix (applying the charging selection code to a toll call prefix). Set call prefix to "0" and charging selection code to "101".

```
ADD CNACLD: PFX=K'0, CSA=NTT, RSC=10, MINL=4, MAXL=24, CHSC=101;
```

📖 **Note:**

When a subscriber of an end office originates a toll call through the trunk group "31", the local office will carry out the following operations:

- Check whether the call signaling from the end office contains the caller number. If it contains the caller number, the local office will connect the call. If it contains no caller number, the local office will request the caller number from the end office through signaling.
- After the call ends, the local office will generate two bills, one trunk bill and one ordinary bill. The trunk bill will be sorted by the trunk group number at the billing center for call charge settlement between offices. The ordinary bill will be sorted by the caller number at the billing center for the charging of the caller.
- The maintenance personnel at the end office side decide whether the end office charges toll calls made by the subscribers of the local office.

5.2.2 Charging Point Analysis Data

I. Introduction

To settle call charge with other offices in the same network or different networks, SoftX3000 generally charges inter-office trunks. However, individual switching equipments vary from each other in charging capability, signaling capability and call processing capability. For example, switching equipments of concerned two parties have different definitions for charging start point and charging end point, or one party does not support forward signaling or calling party release mode. Thus, for an inter-office call, two parties might generate two different bills, which might result in call charge disputes.

SoftX3000 not only offers perfect signaling capability and powerful call processing capability, but also flexibly defines charging start points and charging end points. It is applicable to various complicated charging scenarios.

II. Example

Requirements: In the case that a toll office does not support the calling party release mode and the called party of a toll call first hooks on, the conversation time recorded at the local office side (end office side) is longer than that at the toll office side. To make the conversation time of a toll call consistent, modify the charging analysis points of the toll call prefix at the local office side.

//Add a charging point analysis record.

```
ADD CHGPNT: CSC=0, CD=K'0, SP=CLD, EP=ANY, DT=0;
```

📖 **Note:**

- The command means that for the national toll call prefix "0", the charging start point is "called party answer" and the charging end point is "either party on-hook".
- For toll calls, the release mode is generally the calling party release mode and so the charging end point should be "calling party on-hook". Therefore, the above configuration is out of usual practice. It is up to telecom operators to select desired configurations.

5.2.3 Distinctive Charging Data

I. Introduction

SoftX3000 achieves distinctive charging on NGN services according to bearer capability or codec, thus significantly enhancing its charging flexibility.

1) Bearer capability is for distinctive charging on individual services or bearer capabilities. For example, for multi-media subscribers A and B, if the bearer capability is set to "IP audio", SoftX3000 charges only IP audio; if it is set to "IP video", SoftX3000 charges only IP video; if it is set to "unrestricted 384K", SoftX3000 charges only the audio and video services that use the 384-kbit/s circuit switching network, and so forth.

2) Codec mode is for distinctive charging on individual media streams. For example, calls between Subscriber A and Subscriber B can be connected through the circuit switching network (codec being G.711) or IP packet network (codec being G.723). If the codec is set to "G.711", SoftX3000 charges only the calls through the circuit switching network; while if it is set to "G.723", SoftX3000 charges only the calls through the IP packet network, and so forth.

II. Example 1 (charging audio and video services distinctively according to bearer capability)

Requirements: An IP multi-media end office connects both voice service subscribers and IP multi-media subscribers. It is required to distinctively charge the audio services and video services of IP multi-media subscribers. For calls within the local network, charge IP audio calls 10 cents per minute and IP video calls 20 cents per minute.

//Add two charging cases. The charging case "150" is for charging on audio calls and use the charging meter 1, while the charging case "151" is for charging on video calls and use the charging meter 11.

```
ADD CHGANA: CHA=150, CHGT=PLSACC, MID=METER1;
ADD CHGANA: CHA=151, CHGT=PLSACC, MID=METER11;
```

//Modify charging modes.

```
MOD CHGMODE: CHA=150, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=150, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=150, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=151, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=151, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=151, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Modify rates of the meters. Modify the rate of the meter 1 to 10 cents per pulse and that of the meter 11 to 20 cents per pulse.

```
MOD MTRR: MID=METER1, RAT=10;
MOD MTRR: MID=METER11, RAT=20;
```

//Add intro-office group charging records. The charging case "150" is for charging on IP audio calls and the charging case "151" is for charging on IP video calls.

```
ADD CHGGRP: RCHS=30, DCHS=254, LOAD=IPAUDIO, CODEC=ALL, CHA=150;
ADD CHGGRP: RCHS=30, DCHS=254, LOAD=IPVEDIO, CODEC=ALL, CHA=151;
```

 Note:

- For charging on IP audio calls, set the parameter "bearer capability" to "IP audio" and use the charging case "150".
- For charging on IP video calls, set the parameter "bearer capability" to "IP video" and use the charging case "151".

//Add multi-media subscribers. Set charging source code to "30" (defined by the ADD CHGGRP command).

```
ADD MSBR: D=K'8780011, LP=0, EID="8780011", RCHS=30, CSC=0, NS=CLIP-1;

ADD MSBR: D=K'8780012, LP=0, EID="8780012", RCHS=30, CSC=0, NS=CLIP-1;
```

III. Example 2 (charging calls distinctively according to codec mode)

Requirements: For Access Media Gateway (AMG) subscribers, their call quality is closely related to codec modes, thus needing distinctive charging. Take toll calls as an example. When the codec is set to "G.711 A" or "G.711 μ", the rate is 7 cents per second; while when the codec is set to "G.723" or "G.729", the rate is 30 cents per minute.

//Add two charging cases. The charging case "155" is for the case that the codec is set to "G.711 A" or "G.711 μ" and the rate is 7 cents per pulse. The charging case "156" is for the case that the codec is set to "G.723" or "G.729" and the rate is 30 cents per pulse.

```
ADD CHGANA: CHA=155, CHGT=DETAIL, RAT=7;

ADD CHGANA: CHA=156, CHGT=DETAIL, RAT=30;
```

//Modify charging modes.

```
MOD CHGMODE: CHA=155, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=155, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=155, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=156, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=156, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=156, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add charging case indexes. Set charging selection code to "100" and caller charging source code to "50".

```
ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G71164A, CHA=155;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G71164U, CHA=155;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G71156A, CHA=155;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G71156K, CHA=155;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G7231, CHA=156;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G7231A, CHA=156;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G729, CHA=156;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G729B, CHA=156;

ADD CHGIDX: CHSC=100, RCHS=50, LOAD=ALL, CODEC=G729AB, CHA=156;
```

 Note:

- When the voice coding applies G.711A or G.711μ, set the parameter "CODEC" to "G.711_A_LAW" or "G.711_U_LAW" and use the charging case "155".
- When the voice coding applies G.723 or G.729, set "CODEC" to "G.723" or "G.729" and use the charging case "156".

//Add voice service subscribers. Set charging source code to "50" (defined by the ADD CHGIDX command).

```
ADD VSBR: D=K'6540001, LP=0, MN=22, DID=ESL, EID="iad0021.com", TID=1,
CODEC=PCMA, RCHS=50, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540002, LP=0, MN=22, DID=ESL, EID="iad0021.com", TID=2,
CODEC=PCMA, RCHS=50, CSC=0, NS=CLIP-1;
```

 Note:

The parameter "codec prefer" specifies the first codec choice of ESL subscribers. Its default value is "PCMA (G.711A)".

5.2.4 Called Group Charging Data

I. Introduction

The called group charging mode charges called parties. It is parallel to the charging on calling parties. In general, SoftX3000 charges only calling parties. If a subscriber applies the called group charging mode at the same time, SoftX3000 actually carries out bi-directional charging for the subscriber.

II. Example

Requirements: Charge the new batch of Personal Handy phone System (PHS) subscribers in the local network when they answer calls at the rate of 5 cents per minute.

//Add a charging case. Set charging case to "110", payer to "called party", charging method to "detailed ticket", and detailed ticket rate to "5".

```
ADD CHGANA: CHA=110, PAY=CALLED, CHGT=DETAIL, RAT=5;
```

📕 **Note:**

- For the called group charging, the parameter "payer" must be set to "called party". To ease bill querying, generally set the parameter "charging method" to "detailed ticket".
- If the local office applies the offline billing mode, you needn't specify the parameter "detailed ticket rate" here.

//Modify charging modes.

```
MOD CHGMODE: CHA=110, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=110, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=110, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add a called group charging record. Set called charging source to "200" and charging case to "110".

```
ADD CHGCLD: DCHS=200, LOAD=ALL, CODEC=ALL, CHA=110;
```

📕 **Note:**

- The parameter "called charging source" cannot be set to "254", otherwise, all subscribers of the local office will apply the called group charging mode.
- The referenced charging case's payer must be "called party".

//Modify the charging attributes of specified subscribers (that is, configure called charging mode for specified subscribers). Set callee charging source code to "200".

```
MOD VSBR: D=K'6540001, LP=0, DCHS=200;
MOD MSBR: D=K'8780001, LP=0, DCHS=200;
```

📕 **Note:**

The called group charging mode has its own limitations because it is not related to the position of the caller. So take care when using it.

//Modify the charging attributes of specified subscribers (that is, remove the called charging mode for specified subscribers).

```
MOD VSBR: D=K'6540001, LP=0, DCHS=255;

MOD MSBR: D=K'8780001, LP=0, DCHS=255;
```

📖 **Note:**

To remove the called charging mode for a subscriber, just modify the parameter "callee charging source code" to "255".

5.2.5 Third Party Charging Data

I. Introduction

In the third party charging mode, a third party pays the charge of a call and both the calling and called parties will not pay for the call. In actual applications, a third party might be subscriber number, national valid number, international valid number, Centrex group number, account card and bank account. Among them, the account card charging and bank account charging are achieved through offline billing.

To achieve third party charging, there are two ways. One is to define a third party number in a charging case, which is applicable to group subscribers. The other is to modify the charged number, which is applicable to individuals.

II. Example 1 (recording call charge of incoming trunks to a number)

Requirements: A Private Branch Exchange (PBX) is connected to SoftX3000 over R2 trunks in the local network of City A. Configure charging data at SoftX3000 side. Charge the subscriber number "3630000" for all toll calls of PBX subscribers over R2 incoming trunks and the subscriber number "3630001" for calls within the local network.

//Add two charging cases. The charging case "120" is for charging on toll calls and the charging number is "3630000". The charging case "121" is for charging on calls within the local network and the charging number is "3630001".

```
ADD CHGANA: CHA=120, PAY=THIRD, CHGT=DETAIL, BNT=DN, BDN=K'3630000;

ADD  CHGANA:  CHA=121,  PAY=THIRD,  CHGT=PLSACC,  MID=METER20,  BNT=DN,
BDN=K'3630001;
```

Note:

For the third party charging, the parameter "payer" must be set to "third party".

//Modify charging modes.

```
MOD CHGMODE: CHA=120, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=120, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=120, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
MOD CHGMODE: CHA=121, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=121, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=121, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add a charging case index. Set caller charging source code to "20" and charging case to "120".

```
ADD CHGIDX: CHSC=0, RCHS=20, LOAD=ALL, CODEC=ALL, CHA=120;
```

//Add an intra-office group charging record. Set the caller charging source code to "20", callee charging source code to "254" (wildcard) and charging case to "121".

```
ADD CHGGRP: RCHS=20, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=121;
```

//Add an R2 trunk group. Set charging source code to "20".

```
ADD N1TG: TG=16, G=IN, SRC=16, RCHS=20;
```

Note:

After SoftX3000 carries out the above commands, the charging number on bills of all toll calls of PBX subscribers over R2 incoming trunks is "3630000" and that on bills of calls within the local network is "3630001".

III. Example 2 (recording charge of all calls made by a customer service center to a bank account)

Requirements: The customer service center of a company has 16 operator positions. Charge a bank account for all calls made by the customer service center.

//Add two charging cases. The charging case "122" is for charging on toll calls. Set charging number type to a bank account and charging number to "123456789". The charging case "123" is for charging on calls within the local network. Set charging number type to a bank account and charging number to "123456789".

```
ADD CHGANA: CHA=122, PAY=THIRD, CHGT=DETAIL, BNT=BANK3, BDN=K'123456789;

ADD CHGANA: CHA=123, PAY=THIRD, CHGT=PLSACC, BNT=BANK3, BDN=K'123456789;
```

 Note:

For the third party charging, the parameter "payer" must be set to "third party".

//Modify charging modes.

```
MOD CHGMODE: CHA=122, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;

MOD CHGMODE: CHA=122, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;

MOD CHGMODE: CHA=122, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";

MOD CHGMODE: CHA=123, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=123, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=123, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add a charging case index. Set caller charging source code to "21" and charging case to "122".

```
ADD CHGIDX: CHSC=0, RCHS=21, LOAD=ALL, CODEC=ALL, CHA=122;
```

//Add an intra-office group charging record. Set caller charging source code to "21", callee charging source code to "254" (wildcard) and charging case to "123".

```
ADD CHGGRP: RCHS=21, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=123;
```

//Add voice service subscribers. Set charging source code to "21".

```
ADD VSBR: D=K'6540001, LP=0, MN=22, DID=ESL, EID="iad0021.com", TID=1,
CODEC=PCMA, RCHS=21, CSC=0, NS=CLIP-1;
ADD VSBR: D=K'6540002, LP=0, MN=22, DID=ESL, EID="iad0021.com", TID=2,
CODEC=PCMA, RCHS=21, CSC=0, NS=CLIP-1;
```

📖 **Note:**

After SoftX3000 carries out the above commands, the charging number on bills of all calls of the customer service center is the bank account "123456789".

IV. Example 3 (multiple subscriber numbers use a charging number)

Requirements: A subscriber has installed two telephones in his home, "6540001" and "6540002". Charge all calls of the two telephones to the number "6540001".

//Modify the charging number of a subscriber. Set original charging subscriber number to "6540002" and new charging subscriber number to "6540001".

```
MOD CHGNUM: DN=K'6540002, JFDN=K'6540001;
```

📖 **Note:**

After carrying out the above commands, SoftX3000 will charge the number "6540001" for all calls made by the number "6540002".

5.2.6 Centrex Charging Data

I. Example 1 (charging internal calls of a Centrex group)

Requirements: Charge outgoing calls of a Centrex group as ordinary calls and internal calls at a rate of 5 cents per minute.

//Add a Centrex group. Set CENTREX group number to "8" and out-group prefix to "9".

```
ADD CXGRP: CGN="Huawei", CXG=8, OGP=K'9, DOD2=YES, UCPC=100;
```

//Add a Centrex call prefix. Set CENTREX call prefix to "2", minimum number length and maximum number length to "4".

```
ADD ICXPFX: CXG=8, PFX=K'2, CSA=CIG, MINL=4, MAXL=4;
```

📖 **Note:**

Set the parameter "service attribute" to "intra-Centrex" because the prefix "2" is primarily for calls between subscribers of a Centrex group.

//Add a charging case. Set charging case to "130" (for charging internal calls of a Centrex group).

```
ADD CHGANA: CHA=130, CHGT=PLSACC, MID=METER10;
```

📖 **Note:**

For charging internal calls of a Centrex group, generally set the parameter "charging method" to "meter table".

//Modify charging modes.

```
MOD CHGMODE: CHA=130, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=130, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=130, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Modify the rate of a meter. Set meter table to "meter table 10" and tariff to "5".

```
MOD MTRR: MID=METER10, RAT=5;
```

//Add a Centrex group charging record. Set charging case to "130".

```
ADD CHGCX: CXG=8, CHA=130;
```

//Add a batch of ESL subscribers. Set charging source code to "65" (for ordinary intra-office group charging and destination code charging) and CENTREX group number to "8" (for charging internal calls of a Centrex group).

```
ADB VSBR: SD=K'6540000, ED=K'6540031, LP=0, MN=22, DID=ESL, EID="amg5000.com",
STID=0, CODEC=PCMA, RCHS=65, CSC=1, NS=CLIP-1, CGF=YES, CXG=8, SCXD=K'2000,
COR=ITT-1&IITT-1;
```

Note:

- When a Centrex subscriber makes an internal call, SoftX3000 will charge the call according to the charging case defined by Centrex intra-group charging because Centrex intra-group charging has a higher priority than intra-office group charging and destination code charging.
- Centrex intra-group charging does not differentiate bearer capability and codec mode. To carry out distinctive charging on internal calls of a Centrex group, apply the intra-office group charging or destination code charging.

II. Example 2 (SoftX3000 sends ordinary bills to a console)

Requirements: SoftX3000 works as an end office in a local network. All its toll calls are charged by the toll office. A u-path console in a Centrex group will offer bill querying function and thus requires that SoftX3000 send ordinary bills to it.

//Add a charging case. Set charging case to "140" and charging method to "meter table".

```
ADD CHGANA: CHA=140, PAY=CALLER, CHGT=PLSACC;
```

Note:

- If toll call prefixes have no charging case, SoftX3000 might generate a great many charging alarms. To avoid such case and enable SoftX3000 to send bills of toll calls to the u-path, it is required to add a charge case for toll call prefixes and set the parameter "payer" to "calling party", instead of "no charge", although the local office does not charge toll calls.
- With charging data itself, the u-path has a lower requirement of bills. Bills need contain only basic charging information (such as caller number, called number, answer time and conversation end time). To reduce load on SoftX3000, generally set the parameter "charging method" to "meter table".

//Modify charging modes.

```
MOD CHGMODE: CHA=140, DAT=NORMAL, TS1="00&00", TA1=60, PA1=0, TB1=60, PB1=0,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=140, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=0, TB1=60, PB1=0,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=140, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=0, TB1=60, PB1=0,
AGIO1=100, TS2="00&00";
```

📖 **Note:**

To avoid the case that SoftX3000 charges toll calls, set the parameter "start pulse 1"
and "continued pulse 1" to "0".

//Add a Centrex group. Set CENTREX group number to "8" and out-group prefix to "9".

```
ADD CXGRP: CGN="Huawei", CXG=8, OGP=K'9, DOD2=YES, UCPC=100;
```

//Modify the attributes of a Centrex group to enable SoftX3000 to send bills to the
u-path.

```
MOD CXGRP: CXG=8, BSCF=DTM;
```

📖 **Note:**

- To enable SoftX3000 to send ordinary bills of Centrex subscribers to the u-path, set
  the parameter "send ticket to console" to "detailed ticket and meter table", not "not
  send".
- In the regular bill fetching mode, the u-path will send the request of "Request bill
  sending" to SoftX3000 at predetermined intervals. On receipt of the request,
  SoftX3000 will read bills from the host bill pool or bill server and send them to the
  u-path through dedicated communication links.

III. Example 3 (SoftX3000 sends immediate bills to a console)

Requirements: SoftX3000 works as an end office in a local network. All its toll calls are
charged by the toll office. Telecom operators offer the IP supermarket service through
the u-path and thus require that SoftX3000 send immediate bills to the u-path. In this
way, the u-path can print bills for Centrex subscribers in real time.

Configuration steps of this example are basically the same as those of the above
example. Just add the following step to the end of the above example.

//Modify the charging attributes of a Centrex subscriber. Modify charging category to
"immediately sending to printer".

```
MOD VSBR: D=K'8780200, LP=0, CHT=IMP;
```

📖 **Note:**

- When a Centrex subscriber finishes a call, to enable an operator to immediately print the bill on the u-path and query the call charge, set the charging category of the Centrex subscriber to "immediately sending to printer".
- To enable a u-path to receive immediate bills from SoftX3000, select the option "receive immediate bills" on the bill management menu at the u-path side.
- To facilitate management of immediate bills, it is recommended to grant only one u-path the authority to receive immediate bills in a Centrex group. When there are multiple granted u-paths, SoftX3000 sends immediate bills only to the last logged-on u-path.

IV. Example 4 (charging Centrex subscribers when they originate toll calls through a console)

Requirements: In general, SoftX3000 charges the console that forwards toll calls for Centrex subscribers who have no authority to make toll calls. This example requires that SoftX3000 charge the subscribers, instead of the console.

//Add a Centrex group. Set CENTREX group number to "8" and out-group prefix to "9".

```
ADD CXGRP: CGN="Huawei", CXG=8, OGP=K'9, DOD2=YES, UCPC=100;
```

//Modify the attributes of the Centrex group. Set forward charge not record in console to "yes".

```
MOD CXGRP: CXG=8, TBNC=YES;
```

📖 **Note:**

To charge Centrex subscribers when they originate toll calls through a console, set the parameter "forward charge not record in console" to "yes".

5.2.7 Supplementary Service Charging Data

I. Introduction

SoftX3000 primarily uses meters to charge supplementary services, that is, charges subscribers according to the times that they register or use supplementary services. For call forwarding services, SoftX3000 can also charge subscribers according to the

destination numbers, that is, uses the intra-office group charging or destination code charging mode.

Besides, telecom operators can apply different charging strategies to charge supplementary services. For example, apply the "monthly rental" mode to charge the Calling Line Identity Presentation (CLIP).

II. Example

Requirements: Configure charging data at the SoftX3000 side to charge subscribers who use supplementary services. This example supposes all supplementary services use two meters. Table 5-1 gives charging strategies.

Table 5-1 Charging strategies for supplementary services

Supplementary service	Meter	Number of pulse	Rate (cent/pulse)
Abbreviated dialing	Meter 15	1	10
Hot line	Meter 15	1	10
Do not disturb	Meter 15	1	10
Wakeup	Meter 15	1	10
Call back on busy	Meter 15	1	10
Call forwarding no reply	Meter 16	1	5
Call forwarding unconditional	Meter 16	1	5
Call forwarding busy	Meter 16	1	5
Call waiting	Meter 16	1	5
Absent subscriber	Meter 16	1	5

//Modify the rates of meters. Modify the rate of the meter 15 to 10 cents per pulse and that of the meter 16 to 5 cents per pulse.

```
MOD MTRR: MID=METER15, RAT=10;
MOD MTRR: MID=METER16, RAT=5;
```

//Add supplementary service charging records.

```
ADD CHGSS: NS=ADU, RCHS=254, MID=METER15, PLSN=1;
ADD CHGSS: NS=HLU, RCHS=254, MID=METER15, PLSN=1;
ADD CHGSS: NS=DDU, RCHS=254, MID=METER15, PLSN=1;
ADD CHGSS: NS=ACU, RCHS=254, MID=METER15, PLSN=1;
ADD CHGSS: NS=CBU, RCHS=254, MID=METER15, PLSN=1;
ADD CHGSS: NS=CFNRU, RCHS=254, MID=METER16, PLSN=1;
ADD CHGSS: NS=CFUU, RCHS=254, MID=METER16, PLSN=1;
```

```
ADD CHGSS: NS=CFBU, RCHS=254, MID=METER16, PLSN=1;

ADD CHGSS: NS=CWU, RCHS=254, MID=METER16, PLSN=1;

ADD CHGSS: NS=ASU, RCHS=254, MID=METER16, PLSN=1;
```

📖 **Note:**

● The charging source code "254" is a wildcard and stands for all charging source codes (applicable to all subscribers).

● The example defines only how SoftX3000 charges subscribers when they use supplementary services. In actual application, SoftX3000 can define how to charge subscribers when they register or cancel some supplementary services.

● The example defines charging cases for call forwarding supplementary services, so SoftX3000 will generate two bills for a subscriber who uses these services. One is for the charging of the supplementary service and the other is for the charging of the call to the destination number.

5.2.8 Instant Charging Data (Charging Rate)

I. Introduction

To immediately charge users who make calls on pay phones or through Internet Personal Numbers (IPN), define complete and precise rates for corresponding charging cases.

II. Requirements

Configure charging rates at SoftX3000 side to achieve precise charging of calls through pay phones or IPNs and to display the charges immediately. For separate definitions of charging data of supplementary services, refer to Section 5.2.7. Table 5-2 gives charging requirements.

Table 5-2 Charging requirements

Changing case	Charging method	Object	Rate (cent/pulse)	Meanings
1	Detailed ticket	Ordinary international toll calls	80	SoftX3000 takes six seconds as a charging pulse. It discounts 40 per cent on calls on Saturdays, Sundays and national holidays, and calls during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays.

Changing case	Charging method	Object	Rate (cent/pulse)	Meanings
2	Detailed ticket	Ordinary national toll calls	7	SoftX3000 takes six seconds as a charging pulse. It discounts 40 per cent on calls on Saturdays, Sundays and national holidays, and calls during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays.
3	Detailed ticket	IP international toll calls	250	SoftX3000 takes 60 seconds as a charging pulse and gives no discount.
4	Detailed ticket	IP national toll calls	30	SoftX3000 takes 60 seconds as a charging pulse and gives no discount.
11	Meter 1	Calls within the business area	10	SoftX3000 adds 2 to the meter counts for first 180 seconds and 1 every following 60 seconds. It gives no discount during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays.
12	Meter 2	Calls between business areas	20	SoftX3000 adds 1 to the meter counts for first 60 seconds and 1 every following 60 seconds. It gives no discount during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays.
13	Meter 3	Calls to "13X"	30	SoftX3000 adds 1 to the meter counts for first 60 seconds and 1 every following 60 seconds. It gives no discount during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays.
14	Meter 4	Calls to "9XX"	25	SoftX3000 adds 1 to the meter counts for first 60 seconds and 1 every following 60 seconds. It gives no discount during 00:00 ~ 07:00 and 21:00 ~ 24:00 on weekdays.

III. Script

//Add charging cases.

```
ADD CHGANA: CHA=1, CHGT=DETAIL, RAT=80;
```

```
ADD CHGANA: CHA=2, CHGT=DETAIL, RAT=7;

ADD CHGANA: CHA=3, CHGT=DETAIL, RAT=250;

ADD CHGANA: CHA=4, CHGT=DETAIL, RAT=30;

ADD CHGANA: CHA=11, CHGT=PLSACC, MID=METER1;

ADD CHGANA: CHA=12, CHGT=PLSACC, MID=METER2;

ADD CHGANA: CHA=13, CHGT=PLSACC, MID=METER3;

ADD CHGANA: CHA=14, CHGT=PLSACC, MID=METER4;
```

📖 **Note:**

The ADD CHGANA command directly defines the detailed ticket rate.

//Modify rates of meters.

```
MOD MTRR: MID=METER1, RAT=10;

MOD MTRR: MID=METER2, RAT=20;

MOD MTRR: MID=METER3, RAT=30;

MOD MTRR: MID=METER4, RAT=25;
```

📖 **Note:**

By default, the rate of each meter is 10 cents per pulse. To change the rate, carry out the MOD MTRR command.

//Add date categories.

```
ADD DCAT: MON=JAN, DAY=1, DAT=DTYPE2;

ADD DCAT: MON=FEB, DAY=1, DAT=DTYPE2;

ADD DCAT: MON=FEB, DAY=2, DAT=DTYPE2;

ADD DCAT: MON=FEB, DAY=3, DAT=DTYPE2;

ADD DCAT: MON=MAY, DAY=1, DAT=DTYPE2;

ADD DCAT: MON=MAY, DAY=2, DAT=DTYPE2;

ADD DCAT: MON=MAY, DAY=3, DAT=DTYPE2;

ADD DCAT: MON=OCT, DAY=1, DAT=DTYPE2;

ADD DCAT: MON=OCT, DAY=2, DAT=DTYPE2;

ADD DCAT: MON=OCT, DAY=3, DAT=DTYPE2;
```

 Note:

The example defines Jan. 1, Feb. 1, Feb. 2, Feb. 3, May 1, May 2, May 3, Oct. 1, Oct. 2 and Oct. 3 as "Category 2" to offer discounts for toll calls on these days.

//Modify charging modes (for toll calls).

```
MOD CHGMODE: CHA=1, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=1, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=1, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
MOD CHGMODE: CHA=2, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=2, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=2, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
MOD CHGMODE: CHA=3, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
TS2="00&00";
MOD CHGMODE: CHA=3, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
TS2="00&00";
MOD CHGMODE: CHA=3, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
TS2="00&00";
MOD CHGMODE: CHA=4, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
TS2="00&00";
MOD CHGMODE: CHA=4, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
TS2="00&00";
MOD CHGMODE: CHA=4, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
TS2="00&00";
```

📖 **Note:**

- By default, Monday to Thursday are defined as normal workdays, Friday as Category 1, and Saturday and Sunday as Category 2.
- Such days as Jan. 1, Feb. 1, Feb. 2, Feb. 3, May 1, May 2, May 3, Oct. 1, Oct. 2 and Oct. 3, have been defined as "Category 2".

//Modify charging modes (for non-toll calls).

```
MOD CHGMODE: CHA=11, DAT=NORMAL, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=11, DAT=DTYPE1, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=11, DAT=DTYPE2, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=12, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=12, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=12, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=13, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=13, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=13, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=14, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=14, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=14, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

5.2.9 Instant Charging Data (KC16 Public Telephone)

I. Introduction

KC16 public telephone refers to such telephones as IC public phone, magcard phone and coin-box, which are charged based on the KC16 charging pulse received from the switching system. The basic working principle is as follows: SoftX3000 automatically calculates the quantity of pulse strings to be sent to the public telephone according to

the preset charging rate, actual conversation duration and the rate of single KC16 pulse string, and then controls IAD or AMG to send 16 kHz pulse strings to the public telephone regularly. Finally, the public telephone calculates the conversation charge based on the quantity of pulse strings. Note that the charging of public telephones depends on the quantity of pulse strings instead of pulse. Pulse string is a string of pulse.

KC16 public telephone has two modes: Karlson and Handson.

1) Karlson mode means that pulse strings are sent only when conversation fee reaches a certain preset value instead of regularly. Suppose that the rate of one pulse string is 5 cents, 0.05 dollar is charged for one minute of local call, and 0.5 dollar is charged for one minute of toll call. If a subscriber makes a local call on a public telephone, SoftX3000 will send one pulse string first at the moment when the call is put through, and then send one pulse string every one minute. If a subscriber makes a toll call on a public telephone, SoftX3000 will send one pulse string first at the moment when the call is put through, and then send one pulse string every six seconds.

2) Handson mode means that pulse strings are sent regularly. For example, if a subscriber makes a local call on a public telephone, SoftX3000 will send one pulse string first at the moment when the call is put through, and then send one pulse string every one minute. If a subscriber makes a toll call on a public telephone, SoftX3000 will send ten pulse strings first at the moment when the call is put through, and then send ten pulse strings every one minute.

By default, SoftX3000 supports Karlson mode. If Handson mode is needed, modify the corresponding system software parameter.

II. Requirements

It is required to implement instant charging on IC public telephones (KC16 mode) numbered from 6540001 to 6540004 of the local office by configuring data at SoftX3000 side.

III. Script

//Modify the meter rate to 0.05 cent for one KC16 pulse string.

```
MOD MTRR: MID=KC16, RAT=5;
```

📖 **Note:**

● The rate of single KC16 pulse string should be set with reference to the charging policy of the carrier.

● SoftX3000 automatically calculates the quantity of pulse strings to be sent to the IC public telephones according to the preset charging rate, actual conversation duration and the rate of single KC16 pulse string.

//Modify the charging attribute of voice subscribers.

```
MOD VSBR: D=K'6540001, LP=0, KC16=YES, CHT=IMU;
MOD VSBR: D=K'6540002, LP=0, KC16=YES, CHT=IMU;
MOD VSBR: D=K'6540003, LP=0, KC16=YES, CHT=IMU;
MOD VSBR: D=K'6540004, LP=0, KC16=YES, CHT=IMU;
```

📖 **Note:**

● To achieve instant charging on IC public telephone by SoftX3000, set the parameter "KC16 flag" to "Yes" and modify "Charging category" to "Immediate subscriber table".

● If instant charging is adopted, you cannot set the parameter "Charging category" to "Free"; otherwise, SoftX3000 will be unable to send polarity reversal signal, KC16 pulse or trunk charging pulse to IC public telephones.

● The IAD or AMG connected with IC public telephones is required to support KC16 function.

5.2.10 Instant Charging Data (Polarity Reversal Public Telephone)

I. Introduction

Polarity reversal public telephone refers to such public telephones as magcard telephone and coin-box, which are charged based on the voltage polarity of the subscriber lines. The basic working principle is as follows: SoftX3000 controls IAD or AMG to reverse the voltage polarity of the subscriber lines based on the hook-ons or hook-offs of both calling and called subscribers. On receiving the polarity reversal information, the public telephone carries out the corresponding operation.

Polarity reversal public telephone has two modes: polarity reversal mode and polarity reversal pulse mode.

1) Polarity reversal mode means that the public telephone with charging function has already charging data, and requires only the call start and end time, which can be indicated by SoftX3000 through reversing the voltage polarity of the subscriber line.

2) Polarity reversal pulse mode is employed on the public telephone without charging function. The working principle is as follows: After a subscriber inserts several coins and dials a number on a public telephone, SoftX3000 will indicate the "callee off-hook" event by reversing the voltage polarity of the subscriber line, and then starts the time monitor based on the supported conversation duration (set by SoftX3000). When the conversation duration times out, SoftX3000 will recover the voltage polarity of the subscriber line within 300ms. At this time, if the subscriber inserts coins again, the public telephone will reverse the voltage polarity again to extend the conversation duration; if not, the public telephone will release the call forcedly.

By default, SoftX3000 supports polarity reversal mode. If polarity reversal pulse mode is required, modify the corresponding system software parameter.

II. Requirements

It is required to implement instant charging on magcard public telephones (adopting polarity reversal mode) numbered from 6540011 to 6540014 of the local office by configuring data at SoftX3000 side.

III. Script

//Modify the charging attribute of voice subscribers.

```
MOD VSBR: D=K'6540011, LP=0, POLAR=YES, CHT=IMU;
MOD VSBR: D=K'6540012, LP=0, POLAR=YES, CHT=IMU;
MOD VSBR: D=K'6540013, LP=0, POLAR=YES, CHT=IMU;
MOD VSBR: D=K'6540014, LP=0, POLAR=YES, CHT=IMU;
```

📖 **Note:**

- To achieve instant charging on magcard public telephone by SoftX3000, set the parameter "Polar flag" to "True" and modify "Charging category" to "Immediate subscriber table".
- If instant charging is adopted, you cannot set the parameter "Charging category" to "Free"; otherwise, SoftX3000 will be unable to send polarity reversal signal, KC16 pulse or trunk charging pulse to magcard public telephones.
- The IAD or AMG connected with magcard public telephones is required to support polarity reversal function.

5.2.11 Instant Charging Data (Trunk Charging Pulse)

I. Introduction

Trunk charging pulse is sent to the end office without toll charging function from the senior office with toll charging function (tandem office or toll office, for example). Upon receiving the trunk charging pulse, the end office will transfer it to the public telephone. For an office, the charging pulse set for outgoing trunk calls and that set for incoming trunk calls are of different meanings.

1) Outgoing trunk: For outgoing calls from the trunk group of the local office, the local office receives the charging pulse or charging message (CRG or MPM) from the peer office.

2) Incoming trunk: For incoming calls to the trunk group of the local office, the local office sends the charging pulse or charging message (CRG or MPM) to the peer office.

II. Requirements

It is required to meet the following requirements by configuring data at SoftX3000 side:

1) For the outgoing No.7 trunks, the local office can receive charging pulse in signaling messages sent from the peer office.

2) For the incoming No.7 trunks, the local office can send charging pulse in signaling messages to the peer office.

III. Script (applicable to outgoing No.7 trunk)

//Modify the charging attribute of the outgoing No.7 trunk group.

```
MOD N7TG: TG=30, UPF=YES;
```

  Note:

If a call is made on a public telephone of the local office, to enable SoftX3000 to receive
the charging pulse in the signaling message returned by the peer office, the parameter
"Use opposite pulse" of the command must be set to "Yes".

IV. Script (applicable to incoming No.7 trunk)

//Modify the meter rate to 30 cents for one trunk charging pulse.

```
MOD MTRR: MID=TKCHGPLS, RAT=30;
```

  Note:

- The rate of single trunk charging pulse should be set with reference to the charging
  policy of the carrier.
- SoftX3000 will automatically calculate the quantity of charging pulse to be sent to
  the peer office according to the preset charging rate, actual conversation duration
  and the rate of single trunk charging pulse.

//Modify the charging attribute of the incoming No.7 trunk group.

```
MOD N7TG: TG=31, UPF=YES;
```

  Note:

If a call is made on a public telephone of the peer office, to enable SoftX3000 to send
charging pulse to the peer office, the parameter "Use opposite pulse" of the command
must be set to "Yes".

5.3 Configuring Signaling Data

5.3.1 MTP Signaling Route Data

I. Introduction

Signaling route is a pre-defined path for signaling messages to be sent from a Signaling Point (SP) to a destination. Depending on specific features and functions, signaling route can be divided into two types: normal route and alternative route.

- Normal route refers to the route for transmitting signaling traffic in normal conditions. If an SP has several signaling routes in a signaling network and one of them is a direct route (adopting direct connection mode), the direct route is a normal route. If all signaling routes of an SP are transferred by Signaling Transfer Point (STP) (adopting quasi-associated mode), the shortest one is a normal route. In addition, if two signaling routes in quasi-associated mode share the load, they are both normal routes.

- Alternative route refers to the route for transmitting signaling traffic when the normal route is unavailable due to the fault of signaling link or route. Alternative route is a quasi-associated route transferred by STP(s). It can be one or several routes. If there are several alternative routes, they should be labeled as the first alternative route, the second alternative route and so on based on the ascending times of passing through STP.

General rules for signaling route selection:

1) Choose the normal route in priority. Choose alternative route only when the normal route is unavailable due to fault.

2) If there are several alternative routes, choose the first alternative route in priority. If the first alternative route is unavailable, choose the second alternative route. Other cases can be deduced in the same way.

3) Among normal or alternative routes, if there are two routes with the same priority, they should share the load, that is, each route carry 50% of the whole signaling traffic.

II. Exampel 1 (configuring MTP signaling route in load sharing mode)

Suppose SoftX3000 functions as SPA in a local network, and it networks with a PSTN switch (SPB in the signaling network) as follows.

Figure 5-3 Signaling networking model of a local network (1)

It is required to achieve load sharing of signaling traffic between two normal routes from SPA to SPB by configuring signaling route data at SoftX3000 side.

//Add three MTP Destination Signaling Points (DSPs), with DSP index as 0 indicating SPB, DSP index as 1 indicating STP1, and DSP index as 2 indicating STP2.

```
ADD N7DSP: DPX=0, DPC="0010aa", DPNAME="SPB", STPF=FALSE, ADJF=FALSE;
ADD N7DSP: DPX=1, DPC="001136", DPNAME="STP1", STPF=TRUE, ADJF=TRUE;
ADD N7DSP: DPX=2, DPC="001139", DPNAME="STP2", STPF=TRUE, ADJF=TRUE;
```

📖 **Note:**

- You should set the parameters "STP flag" and "adjacent flag" in the command correctly based on the actual networking conditions; otherwise, you might fail when adding MTP route using the command **ADD N7RT**.
- For SPB with DSP index as 0, to achieve load sharing of signaling traffic between two normal routes from SPA to SPB, you need to set the parameter "linkset select mask" to the default value B1111.

//Add two MTP linksets. Set adjacent DSP index of linkset 1 to 1 and that of linkset 2 to 2.

```
ADD N7LKS: LSX=1, ASPX=1, LSNAME="To STP1";
ADD N7LKS: LSX=2, ASPX=2, LSNAME="To STP2";
```

📖 **Note:**

In SS7, one MTP linkset stands for a signaling route. In this example, two MTP linksets are required to be configured.

//Add four MTP links. Link 2 and link 3 belong to linkset 1; link 4 and link 5 belong to linkset 2.

```
ADD N7LNK: MN=22, LNKN=2, LNKNAME="To STP1", LNKTYPE=0, TS=3, LSX=1, SLC=0,
SLCS=0;
ADD N7LNK: MN=22, LNKN=3, LNKNAME="To STP1", LNKTYPE=0, TS=4, LSX=1, SLC=1,
SLCS=1;
ADD N7LNK: MN=22, LNKN=4, LNKNAME="To STP2", LNKTYPE=0, TS=5, LSX=2, SLC=0,
SLCS=0;
ADD N7LNK: MN=22, LNKN=5, LNKNAME="To STP2", LNKTYPE=0, TS=6, LSX=2, SLC=1,
SLCS=1;
```

📖 **Note:**

- This example supposes that all MTP links are directly provided by the EPII of SoftX3000. In this case, the parameter "module number" in the command **ADD N7LNK** must be set to the module number of the FCSU.
- Because the FCSUs work in active & standby mode, if all MTP links are configured in one FCSU, SoftX3000 is still reliable.

//Add two MTP routes to SPB, with DSP index as 0 and route priority as 0.

```
ADD N7RT: LSX=1, DPX=0, PRI=0, RTNAME="To SPB_1";
ADD N7RT: LSX=2, DPX=0, PRI=0, RTNAME="To SPB_2";
```

📖 **Note:**

The signaling routes from SPA to SPB through STP1 and STP2 are normal routes, so they should enjoy the same priority; otherwise, load sharing cannot be achieved.

III. Example 2 (configuring MTP signaling route in active & standby mode)

Suppose SoftX3000 functions as SPA in a local network, and it networks with a PSTN switch (SPB in the signaling network) as follows.

Figure 5-4 Signaling networking model of a local network (2)

It is required to achieve the following by configuring signaling route data at SoftX3000 side:

1) In normal cases, SoftX3000 chooses the normal route from SPA to SPB.
2) If the normal route is unavailable, SoftX3000 will enable the two alternative routes to work in load sharing mode.

//Add three MTP DSPs, with DSP index as 0 indicating SPB, DSP index as 1 indicating STP1, and DSP index as 2 indicating STP2.

```
ADD N7DSP: DPX=0, DPC="0010aa", DPNAME="SPB", STPF=FALSE, ADJF=TRUE;
ADD N7DSP: DPX=1, DPC="001136", DPNAME="STP1", STPF=TRUE, ADJF=TRUE;
ADD N7DSP: DPX=2, DPC="001139", DPNAME="STP2", STPF=TRUE, ADJF=TRUE;
```

Note:

- You should set the parameters "STP flag" and "adjacent flag" in the command correctly based on the actual networking conditions; otherwise, you might fail when adding MTP route using the command **ADD N7RT**.
- For SPB with DSP index as 0, to achieve load sharing of signaling traffic between two alternative routes from SPA to SPB, you need to set the parameter "linkset select mask" to the default value B1111.

//Add three MTP linksets. Set adjacent DSP index of linkset 0 to 0, that of linkset 1 to 1, and that of linkset 2 to 2.

```
ADD N7LKS: LSX=0, ASPX=0, LSNAME="To SPB";
ADD N7LKS: LSX=1, ASPX=1, LSNAME="To STP1";
ADD N7LKS: LSX=2, ASPX=2, LSNAME="To STP2";
```

📖 **Note:**

In SS7, one MTP linkset stands for a signaling route. In this example, three MTP linksets are required to be configured.

//Add two M2UA links with SoftX3000 as Client.

```
ADD M2LNK: MN=136, LNKN=0, SGID=2, LOCPORT=2904, LOCIP1="191.169.150.30",
PEERIP1="191.169.150.81";
ADD M2LNK: MN=137, LNKN=0, SGID=2, LOCPORT=2910, LOCIP1="191.169.150.30",
PEERIP1="191.169.150.81";
```

📖 **Note:**

If two BSGIs are configured in SoftX3000, it is recommended to configure the two M2UA links in different BSGIs, so as to ensure the reliability of the M2UA links.

//Add six MTP links. Links 0 on the two BSGIs belong to linkset 0; links 1 on the two BSGIs belong to linkset 1; links 2 on the two BSGIs belong to linkset 2.

```
ADD N7LNK: MN=136, LNKN=0, LNKNAME="To SPB", LNKTYPE=2, M2LNKNO=0,
BINIFID=1000, LSX=0, SLC=0, SLCS=0;
ADD N7LNK: MN=136, LNKN=1, LNKNAME="To STP1", LNKTYPE=2, M2LNKNO=0,
BINIFID=1002, LSX=1, SLC=0, SLCS=0;
ADD N7LNK: MN=136, LNKN=2, LNKNAME="To STP2", LNKTYPE=2, M2LNKNO=0,
BINIFID=1004, LSX=2, SLC=0, SLCS=0;
ADD N7LNK: MN=137, LNKN=0, LNKNAME="To SPB", LNKTYPE=2, M2LNKNO=0,
BINIFID=1001, LSX=0, SLC=1, SLCS=1;
ADD N7LNK: MN=137, LNKN=1, LNKNAME="To STP1", LNKTYPE=2, M2LNKNO=0,
BINIFID=1003, LSX=1, SLC=1, SLCS=1;
ADD N7LNK: MN=137, LNKN=2, LNKNAME="To STP2", LNKTYPE=2, M2LNKNO=0,
BINIFID=1005, LSX=2, SLC=1, SLCS=1;
```

 Note:

- This example supposes that all MTP links are directly provided by the built-in SG (such as TMG8010) of SoftX3000. In this case, the parameter "module number" in the command **ADD N7LNK** must be set to the module number of the BSGI.

- Because the BSGIs work in load sharing mode, if all MTP links are configured in one BSGI, the reliability of SoftX3000 cannot be ensured. In this case, it is recommended to configure the links in one linkset in different BSGIs.

//Add three MTP routes to SPB, with DSP index as 0, route priority of linkset 0 as 0, and route priority of linksets 1 and 2 as 1.

```
ADD N7RT: LSX=0, DPX=0, PRI=0, RTNAME="To SPB_0";
ADD N7RT: LSX=1, DPX=0, PRI=1, RTNAME="To SPB_1";
ADD N7RT: LSX=2, DPX=0, PRI=1, RTNAME="To SPB_2";
```

 Note:

- The normal route from SPA to SPB enjoys the highest priority, so its route priority is set to 0.

- The alternative routes enjoy lower priority than the normal route, so their route priorities must be set to 1; otherwise, SPA will not choose the normal route in priority.

5.3.2 M3UA Signaling Route Data

I. Introduction

The basic concepts and route selection principles of M3UA signaling routes are the same as those of MTP signaling routes. Refer to 5.3.1 MTP Signaling Route Data for details.

II. Example 1 (configuring M3UA signaling route in load sharing mode)

Suppose SoftX3000 functions as ASP in a local network, and it networks with a PSTN switch (SP in the signaling network) as follows.
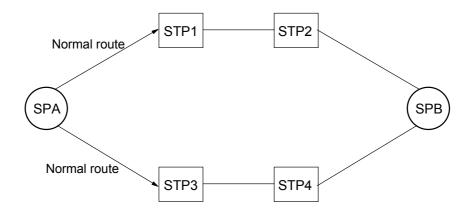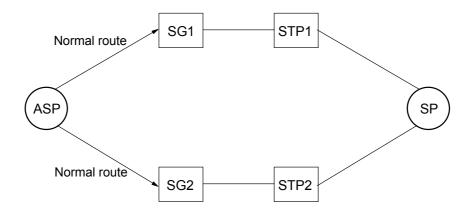
Figure 5-5 Signaling networking model of a local network (1)

It is required to achieve load sharing of signaling traffic between two normal routes from ASP to SP by configuring signaling route data at SoftX3000 side.

//Add one local M3UA entity, with local entity index as 0 and OPC as 001122.

```
ADD M3LE: LEX=0, LENAME="SoftX3000", OPC="001122", LET=AS, RC=333777;
```

📕 **Note:**

"Route context" can be a decimal digit or null (not configured). It should be negotiated with SG7000 in the case of interconnection.

//Add three M3UA destination entities, with DSP index as 10 indicating SG1 connected with SoftX3000 directly, with DSP index as 20 indicating SG2 connected with SoftX3000 directly, and with destination entity index as 30 indicating SP.

```
ADD M3DE: DEX=10, DENAME="SG1", DPC="001171", STPF=TRUE, DET=SG, ADJF=YES;
ADD M3DE: DEX=20, DENAME="SG2", DPC="001172", STPF=TRUE, DET=SG, ADJF=YES;
ADD M3DE: DEX=30, DENAME="SP", DPC="1100cc", STPF=FALSE, DET=SP;
```

 Note:

- You should set the parameters "STP flag" and "adjacent flag" in the command correctly based on the actual networking conditions; otherwise, you might fail when adding M3UA route using the command **ADD M3RT**.
- For SP with destination entity index as 30, to achieve load sharing of signaling traffic between two normal routes from ASP to SP, you need to set the parameter "linkset select mask" to the default value B1111.

//Add two M3UA linksets, with adjacent entity index of linkset 1 as 10 and that of linkset 2 as 20.

```
ADD M3LKS: LSX=1, LSNAME="To SG1", ADX=10, TM=LOADSHARE, WM=ASP;
ADD M3LKS: LSX=2, LSNAME="To SG2", ADX=20, TM=LOADSHARE, WM=ASP;
```

 Note:

- In the M3UA protocol, one M3UA linkset stands for a signaling route. In this example, two M3UA linksets are required to be configured.
- It should be noted that the traffic mode of a linkset only determines the work mode of all M3UA links in this linkset, but irrelevant to the signaling route selection. Unless otherwise specified, it is commended to configure the traffic mode of a linkset to "load-share mode", which must be the same as the configuration at SG side.

//Add two M3UA links. Link 0 in the BSGI 136 belongs to linkset 1; link 0 in the BSGI 137 belongs to linkset 2.

```
ADD M3LNK: MN=136, LNKN=0, LNKNAME="To SG1", LOCIP1="191.169.150.30",
PEERIP1="191.169.150.70", CS=C, LSX=1;
ADD M3LNK: MN=137, LNKN=0, LNKNAME="To SG2", LOCIP1="191.169.150.30",
PEERIP1="191.169.150.71", CS=C, LSX=2;
```

 Note:

If two BSGIs are configured in SoftX3000, it is recommended to configure the two M3UA links in different BSGIs, so as to ensure the reliability of the M3UA links.

//Add two M3UA routes to SP, with destination entity index as 30 and route priority as 0.

```
ADD M3RT: RTNAME="To SP_1", DEX=30, LSX=1, PRI=0;
```

```
ADD M3RT: RTNAME="To SP_2", DEX=30, LSX=2, PRI=0;
```

 Note:

The signaling routes from ASP to SP through SG1 and SG2 are normal routes, so they should enjoy the same priority; otherwise, load sharing cannot be achieved.

III. Example 2 (configuring M3UA signaling route in active & standby mode)

Suppose SoftX3000 functions as ASP in a local network, and it networks with a PSTN switch (SP in the signaling network) as follows.
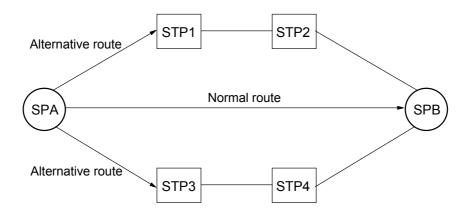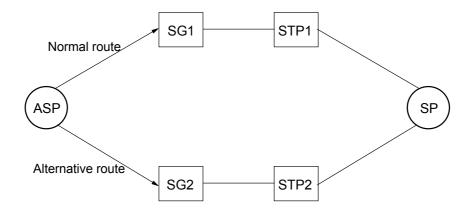

Figure 5-6 Signaling networking model of a local network (2)

It is required to achieve the following by configuring signaling route data at SoftX3000 side:

1) In normal cases, SoftX3000 chooses the normal route from ASP to SP.

2) If the normal route is unavailable, SoftX3000 will use the alternative route.

//Add one local M3UA entity, with local entity index as 0 and OPC as 001122.

```
ADD M3LE: LEX=0, LENAME="SoftX3000", OPC="001122", LET=AS, RC=333777;
```

 Note:

"Route context" can be a decimal digit or null (not configured). It should be negotiated with SG7000 in the case of interconnection.

//Add three M3UA destination entities, with DSP index as 10 indicating SG1 connected with SoftX3000 directly, with DSP index as 20 indicating SG2 connected with SoftX3000 directly, and with destination entity index as 30 indicating SP.

```
ADD M3DE: DEX=10, DENAME="SG1", DPC="001171", STPF=TRUE, DET=SG, ADJF=YES;
ADD M3DE: DEX=20, DENAME="SG2", DPC="001172", STPF=TRUE, DET=SG, ADJF=YES;
ADD M3DE: DEX=30, DENAME="SP", DPC="1100cc", STPF=FALSE, DET=SP;
```

 Note:

You should set the parameters "STP flag" and "adjacent flag" in the command correctly based on the actual networking conditions; otherwise, you might fail when adding M3UA route using the command **ADD M3RT**.

//Add two M3UA linksets. Set adjacent destination index of linkset 1 to 10, and that of linkset 2 to 20.

```
ADD M3LKS: LSX=1, LSNAME="To SG1", ADX=10, TM=LOADSHARE, WM=ASP;
ADD M3LKS: LSX=2, LSNAME="To SG2", ADX=20, TM=LOADSHARE, WM=ASP;
```

 Note:

- In the M3UA protocol, one M3UA linkset stands for a signaling route. In this example, two M3UA linksets are required to be configured.
- It should be noted that the traffic mode of a linkset only determines the work mode of all M3UA links in this linkset, but irrelevant to the signaling route selection. Unless otherwise specified, it is commended to configure the traffic mode of a linkset to "load-share mode", which must be the same as the configuration at SG side.

//Add two M3UA links. Link 0 in the BSGI 136 belongs to linkset 1; link 0 in the BSGI 137 belongs to linkset 2.

```
ADD  M3LNK:  MN=136,  LNKN=0,  LNKNAME="To  SG1",  LOCIP1="191.169.150.30",
PEERIP1="191.169.150.70", CS=C, LSX=1;
ADD  M3LNK:  MN=137,  LNKN=0,  LNKNAME="To  SG2",  LOCIP1="191.169.150.30",
PEERIP1="191.169.150.71", CS=C, LSX=2;
```

  📖 **Note:**

  If two BSGIs are configured in SoftX3000, it is recommended to configure the two
  M3UA links in different BSGIs, so as to ensure the reliability of the M3UA links.

  //Add two M3UA routes to SP, with destination entity index as 30, route priority of linkset
  1 as 0, and route priority of linkset 2 as 1.

```
ADD M3RT: RTNAME="To SP_1", DEX=30, LSX=1, PRI=0;
ADD M3RT: RTNAME="To SP_2", DEX=30, LSX=2, PRI=1;
```

  📖 **Note:**

  - The normal route from ASP to SP through SG1 enjoys the highest priority, so its
    route priority is set to 0.
  - The alternative route from ASP to SP through SG2 enjoys lower priority than the
    normal route, so its route priority must be set to 1; otherwise, ASP will not choose
    the normal route in priority.

5.4 Configuring Routing Data

5.4.1 Load-Sharing Routing Data

I. Introduction

In actual networking, if the outgoing traffic from an office to another office can be
transmitted through several routes, the traffic load will be allocated to each route based
on its specific bearer capability.

II. Requirements

Suppose there are two toll offices in a city for transiting all toll calls in the local network.
See Figure 5-7 for the networking model.
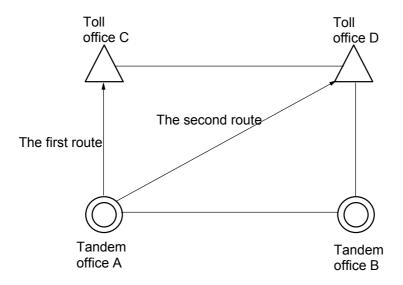
Figure 5-7 Networking model of a local network (1)

SoftX3000 acts as tandem office A in the local network. It is required to achieve load sharing of all outgoing toll traffic between routes from tandem office A to toll office C and toll office D by configuring routing data at SoftX3000 side.

III. Script

//Add two office directions. The office direction from the local office to toll office C is numbered 201, and that from the local office to toll office D is numbered 202.

```
ADD  OFC:  O=201,  ON="To  Office_C",  DOT=CMPX,  DOL=HIGH,  DPC1="110033",
METHOD=NOCONV;
ADD  OFC:  O=202,  ON="To  Office_D",  DOT=CMPX,  DOL=HIGH,  DPC1="110055",
METHOD=NOCONV;
```

//Add two sub-routes numbered 201 and 202 respectively.

```
ADD SRT: SRC=201, O=201, SRN="To Office_C", TSM=CYC;
ADD SRT: SRC=202, O=202, SRN="To Office_D", TSM=CYC;
```

//Add a route numbered 201.

```
ADD RT: R=201, RN="To Toll Office", SRST=PERC, SR1=201, SR2=202, PSR1=50,
PSR2=50;
```

 Note:

- You can implement load-sharing routing in SoftX3000 by the command **ADD RT**.
- To achieve this function correctly, you must set the parameter "sub-route selection mode" to "select by percentage". At the same time, set "1st sub-route" to 201, "2nd sub-route" to 202, "percentage of sub-route1" to 50, and "percentage of sub-route2" to 50.
- Because sub-routes are grouped by percentage, no matter what percentage each sub-route is set with, the total percentage must be integral multiple of 100; otherwise, the system might fail.

//Add route analysis data to toll office.

```
ADD RTANA: RSC=201, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=201,
ISUP=NOCHG;
```

5.4.2 Alternative Routing Data

I. Introduction

Direct route is the route selected for the first time during routing, while alternative route is the route selected for the second time or later during routing.

To improve networking reliability, the network planning department usually designs two or more outgoing routes for an office, among which one is an alternative route. In this case, when the direct route is unavailable, the alternative route can be used.

II. Example 1 (adopting sequential selection mode)

See Figure 5-8 for the networking model of a local network.
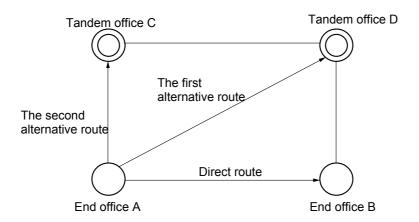
Figure 5-8 Networking model of a local network (2)

Suppose that SoftX3000 acts as end office A in the local network. It is required to achieve the following routing principles by configuring routing data at SoftX3000 side:

1) In normal cases, SoftX3000 chooses the direct route in priority, that is, the route from end office A to end office B.

2) When the direct route is unavailable (due to fault or overflow), SoftX3000 will choose the first alternative route, that is, the route from end office A to tandem office D, and finally to end office B.

3) When both the direct route and the first alternative route are unavailable, SoftX3000 will choose the second alternative route, that is, the route from end office A to tandem office C, then to tandem office D, and finally to end office B.

//Add three office directions. The office direction from the local office to end office B is numbered 211, that from the local office to tandem office D is numbered 212, and that from the local office to tandem office C is numbered 213.

```
ADD  OFC:  O=211,  ON="To  Office_B",  DOT=CC,  DOL=SAME,  DPC1="112233",
METHOD=NOCONV;
ADD  OFC:  O=212,  ON="To  Office_D",  DOT=CMPX,  DOL=HIGH,  DPC1="112255",
METHOD=NOCONV;
ADD  OFC:  O=213,  ON="To  Office_C",  DOT=CMPX,  DOL=HIGH,  DPC1="112266",
METHOD=NOCONV;
```

//Add three sub-routes numbered 211, 212 and 213 respectively. 211 is a direct sub-route, 212 is the first alternative sub-route, and 213 is the second alternative sub-route.

```
ADD SRT: SRC=211, O=211, SRN="To Office_B", TSM=CYC;
ADD SRT: SRC=212, O=212, SRN="To Office_D", TSM=CYC;
ADD SRT: SRC=213, O=213, SRN="To Office_C", TSM=CYC;
```

//Add a route numbered 211.

```
ADD RT: R=211, RN="To Office_B", SRST=SEQ, SR1=211, SR2=212, SR3=213;
```

📖 **Note:**

- You can implement alternative routing in SoftX3000 by the command **ADD RT**.
- If sequential selection mode is adopted for the alternative route selection, you need to set the parameter "sub-route selection mode" to "sequential selection". At the same time, set "1st sub-route" to 211, "2nd sub-route" to 212, and "3rd sub-route" to 213.

//Add route analysis data to end office B.

```
ADD RTANA: RSC=211, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=211,
ISUP=NOCHG;
```

III. Example 2 (adopting selection by percentage mode)

See Figure 5-8 for the networking model of a local network. Suppose that SoftX3000 acts as end office A in the local network. It is required to achieve the following routing principles by configuring routing data at SoftX3000 side:

1)   In normal cases, SoftX3000 chooses the direct route in priority, that is, the route from end office A to end office B.

2)   When the direct route is unavailable, SoftX3000 will choose the first or second alternative route, and they share the load by the ratio of 60% : 40%.

//Add three office directions. The office direction from the local office to end office B is numbered 211, that from the local office to tandem office D is numbered 212, and that from the local office to tandem office C is numbered 213.

```
ADD  OFC:  O=211,  ON="To  Office_B",  DOT=CC,  DOL=SAME,  DPC1="112233",
METHOD=NOCONV;
ADD  OFC:  O=212,  ON="To  Office_D",  DOT=CMPX,  DOL=HIGH,  DPC1="112255",
METHOD=NOCONV;
ADD  OFC:  O=213,  ON="To  Office_C",  DOT=CMPX,  DOL=HIGH,  DPC1="112266",
METHOD=NOCONV;
```

//Add three sub-routes numbered 211, 212 and 213 respectively. 211 is a direct sub-route, 212 is the first alternative sub-route, and 213 is the second alternative sub-route.

```
ADD SRT: SRC=211, O=211, SRN="To Office_B", TSM=CYC;
ADD SRT: SRC=212, O=212, SRN="To Office_D", TSM=CYC;
ADD SRT: SRC=213, O=213, SRN="To Office_C", TSM=CYC;
```

//Add a route numbered 211.

```
ADD RT: R=211, RN="To Office_B", SRST=PERC, SR1=211, SR2=212, SR3=213,
PSR1=100, PSR2=60, PSR3=40;
```

  Note:

- You can implement alternative routing in SoftX3000 by the command **ADD RT**.
- To achieve the selection of alternative sub-route by percentage, you must set the parameter "sub-route selection mode" to "select by percentage". At the same time, set "1st sub-route" to 211, "2nd sub-route" to 212, "3rd sub-route" to 213, "percentage of sub-route1" to 100, "percentage of sub-route2" to 60, and "percentage of sub-route2" to 40.
- Sub-routes (five in total) are grouped by percentage, that is, the sub-route(s) whose total percentage equals to 100% are in one group. Each sub-route in one group shares traffic load by its specific percentage, and different groups are selected by sequence.

//Add route analysis data to end office B.

```
ADD RTANA: RSC=211, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=211,
ISUP=NOCHG;
```

5.4.3 Dynamic Routing Data

I. Introduction

Dynamic routing means that the exchange can update routing data automatically based on time, network state or event, and the updated routing mode can be periodic, non-periodic, pre-defined or change with network state.

SoftX3000 supports the dynamic routing by time. It allows route update within a day or a week based on pre-defined time segment, that is, SoftX3000 can select different routes in different time segments.

II. Example

Suppose SoftX3000 acts as end office A in a local network, and it has three routes to end office B in the same network. See Figure 5-9.
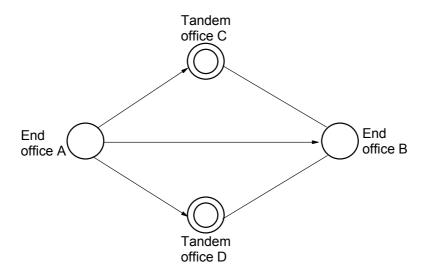
Figure 5-9 Networking model of a local network

Tandem office C and tandem office D have different busy hours. To improve the utilization rate of the circuits between end office A and end office B, it is required to enable different alternative routes during busy and idle hours by configuring routing data at SoftX3000 side. Refer to Table 5-3.

Table 5-3 Routing plan from end office A to end office B

Time segment	Routing plan
00:00~07:59, 21:00~23:59	Direct route: from end office A to end office B Alternative route: from end office A to tandem office C, and finally to end office B
08:00~20:59	Direct route: from end office A to end office B Alternative route: from end office A to tandem office D, and finally to end office B

//Add three office directions. The office direction from the local office to end office B is numbered 231, that from the local office to tandem office C is numbered 232, and that from the local office to tandem office D is numbered 233.

```
ADD  OFC:  O=231,  ON="To  Office_B",  DOT=CC,  DOL=SAME,  DPC1="1122aa",
METHOD=NOCONV;
ADD  OFC:  O=232,  ON="To  Office_C",  DOT=CMPX,  DOL=HIGH,  DPC1="1122bb",
METHOD=NOCONV;
ADD  OFC:  O=233,  ON="To  Office_D",  DOT=CMPX,  DOL=HIGH,  DPC1="1122cc",
METHOD=NOCONV;
```

//Add three sub-routes numbered 231, 232 and 233 respectively. 231 is a sub-route from office A to office B, 232 is a sub-route from office A to office C, and 233 is a sub-route from office A to office D.

```
ADD SRT: SRC=231, O=231, SRN="To Office_B", TSM=CYC;

ADD SRT: SRC=232, O=232, SRN="To Office_C", TSM=CYC;

ADD SRT: SRC=233, O=233, SRN="To Office_D", TSM=CYC;
```

//Add two routes numbered 232 and 233 respectively. 232 is a route selected during idle hours, and 233 is a route selected during busy hours.

```
ADD RT: R=232, RN="A to C to B", SRST=SEQ, SR1=231, SR2=232;

ADD RT: R=233, RN="A to D to B", SRST=SEQ, SR1=231, SR2=233;
```

//Add two time indexes. Time index 1 ranges 00:00~07:59, and time index 2 ranges 08:00~20:59.

```
ADD TMIDX: WD=SUN, TM=8, TMX=1;

ADD TMIDX: WD=MON, TM=8, TMX=1;

ADD TMIDX: WD=TUE, TM=8, TMX=1;

ADD TMIDX: WD=WED, TM=8, TMX=1;

ADD TMIDX: WD=THU, TM=8, TMX=1;

ADD TMIDX: WD=FRI, TM=8, TMX=1;

ADD TMIDX: WD=SAT, TM=8, TMX=1;

ADD TMIDX: WD=SUN, TM=21, TMX=2;

ADD TMIDX: WD=MON, TM=21, TMX=2;

ADD TMIDX: WD=TUE, TM=21, TMX=2;

ADD TMIDX: WD=WED, TM=21, TMX=2;

ADD TMIDX: WD=THU, TM=21, TMX=2;

ADD TMIDX: WD=FRI, TM=21, TMX=2;

ADD TMIDX: WD=SAT, TM=21, TMX=2;
```

 Note:

- SoftX3000 has preset time index 0 during its initialization. The time index table adopts 24-hour indication system by default. If you do not add any time index, time index 0 corresponds to 00:00~23:59.
- After you execute the above commands, time index 1 corresponds to 00:00~07:59, time index 2 corresponds to 08:00~20:59, and time index 0 corresponds to 21:00~23:59.
- During routing, SoftX3000 will match the current time with the time and then the week in the time index table. If the match fails, routing will fail too. Therefore, you should be careful in configuring time index table.

//Add route analysis data. Set route selection code to 231, time index to 0, 1, and 2 respectively, and route number to 232, 232, and 233 respectively.

```
ADD RTANA: RSC=231, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=232,
ISUP=NOCHG;
ADD RTANA: RSC=231, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=1, R=232,
ISUP=NOCHG;
ADD RTANA: RSC=231, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=2, R=233,
ISUP=NOCHG;
```

 Note:

- You can implement dynamic routing in SoftX3000 by the command **ADD RTANA**.
- If you divide a day into three time segments and set the same route selection code for them, you must set a piece of route analysis data for each time index; otherwise, SoftX3000 will fail in routing within a specific time segment.

5.4.4 Special Routing Data

I. Introduction

SoftX3000 is provided with flexible route authentication function, determining whether an outgoing call has the right to use a route and which route is selected based on such conditions as route selection source code, caller type, address indicator, transmission capability and time. This function meets the requirements on routing policy in special applications.

II. Example 1 (routing based on route selection source code)

Suppose SoftX3000 acts as end office A in a local network, and it has direct routes to end office B, tandem offices C and D respectively. See Figure 5-10.
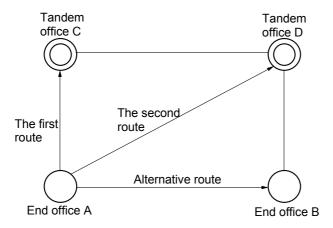
Figure 5-10 Routes for outgoing toll calls originated from end office A

As planned, all outgoing toll calls originated from end office A must be transferred by tandem office C or D, so there are three outgoing routes for end office A: the first route (A→C), the second route (A→D), and alternative route (A→B→D). Due to limited bearer capability of the alternative route for toll calls, it is required to divide the local subscribers into two groups to avoid overload on the alternative route when both the first and the second route are faulty: some subscribers (whose call source code is 0) can use all routes, while the others (whose call source code is 1) are prohibited from using the alternative route.

//Add two call sources. Set call source code to 0 and 1 respectively, route selection code of call source 0 to 0, and route selection code of call source 1 to 1.

```
ADD CALLSRC: CSC=0, CSCNAME="Group_0", PRDN=3, RSSC=0;
ADD CALLSRC: CSC=1, CSCNAME="Group_1", PRDN=3, RSSC=1;
```

//Add 32 ESL subscribers. Set call source code of subscribers 6540000~6540015 to 0, and that of subscribers 8780000~8780015 to 1.

```
ADB   VSBR:   SD=K'6540000,   ED=K'6540015,   LP=0,   MN=22,   DID=ESL,
EID="191.169.150.89:2944", STID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADB   VSBR:   SD=K'8780000,   ED=K'8780015,   LP=0,   MN=22,   DID=ESL,
EID="191.169.150.90:2944", STID=0, CODEC=PCMA, RCHS=87, CSC=1, NS=CLIP-1;
```

//Add three office directions. The office direction from the local office to end office B is numbered 231, that from the local office to tandem office C is numbered 232, and that from the local office to tandem office D is numbered 233.

```
ADD  OFC:  O=231,  ON="To  Office_B",  DOT=CC,  DOL=SAME,  DPC1="1122aa",
METHOD=NOCONV;
ADD  OFC:  O=232,  ON="To  Office_C",  DOT=CMPX,  DOL=HIGH,  DPC1="1122bb",
METHOD=NOCONV;
ADD  OFC:  O=233,  ON="To  Office_D",  DOT=CMPX,  DOL=HIGH,  DPC1="1122cc",
METHOD=NOCONV;
```

//Add three sub-routes numbered 231, 232 and 233 respectively. 231 is a sub-route from office A to office B, 232 is the sub-route from office A to office C, and 233 is the sub-route from office A to office D.

```
ADD SRT: SRC=231, O=231, SRN="To Office_B", TSM=CYC;
ADD SRT: SRC=232, O=232, SRN="To Office_C", TSM=CYC;
ADD SRT: SRC=233, O=233, SRN="To Office_D", TSM=CYC;
```

//Add two routes numbered 232 and 233 respectively. All sub-routes of route 232 can be used for outgoing calls, but the alternative sub-route of route 233 is prohibited from being used for outgoing calls.

```
ADD RT: R=232, RN="For all SRT", SRST=PERC, SR1=232, SR2=233, SR3=231, PSR1=50,
PSR2=50, PSR3=100;
ADD RT: R=233, RN="Except alt-SRT", SRST=PERC, SR1=232, SR2=233, PSR1=50,
PSR2=50;
```

 Note:

For route 232, selection of alternative sub-routes by percentage is adopted.

//Add two route analysis data with route selection code as 231 both, route selection source code as 0 and 1 respectively, route number as 232 and 233 respectively.

```
ADD RTANA: RSC=231, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=232,
ISUP=NOCHG;
ADD RTANA: RSC=231, RSSC=1, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=233,
ISUP=NOCHG;
```

 Note:

Because route selection source code is one of the call source attributes, you can define different route analysis data for different route selection source codes (call sources).

III. Example 2 (routing based on caller type)

Suppose SoftX3000 serves as a toll office in a city, and it has three routes to the senior toll office. As planned, SoftX3000 only allows some subscribers with higher priority to use all routes (routes 1, 2 and 3) when transiting outgoing toll calls originated locally, while allows the other subscribers to use the specified two routes (routes 1 and 2) only.

//Modify the attribute of 16 ESL subscribers. Modify subscriber type of subscribers 6540000~6540015 to "prior".

```
MOB VSBR: SD=K'6540000, ED=K'6540015, LP=0, UTP=PRI;
```

//Add three office directions numbered 1, 2 and 3 respectively.

```
ADD  OFC:  O=1,  ON="To  Office_A",  DOT=CMPX,  DOL=HIGH,  DPC1="1122aa",
METHOD=NOCONV;
ADD  OFC:  O=2,  ON="To  Office_B",  DOT=CMPX,  DOL=HIGH,  DPC1="1122bb",
METHOD=NOCONV;
ADD  OFC:  O=3,  ON="To  Office_C",  DOT=CMPX,  DOL=HIGH,  DPC1="1122cc",
METHOD=NOCONV;
```

//Add three sub-routes numbered 1, 2 and 3 respectively.

```
ADD SRT: SRC=1, O=1, SRN="To Office_A", TSM=CYC;
ADD SRT: SRC=2, O=2, SRN="To Office_B", TSM=CYC;
ADD SRT: SRC=3, O=3, SRN="To Office_C", TSM=CYC;
```

//Add two routes numbered 1 and 2 respectively. All sub-routes of route 1 can be used for outgoing calls, but only sub-routes 1 and 2 of route 2 can be used for outgoing calls.

```
ADD RT: R=1, RN="For all SRT", SRST=PERC, SR1=1, SR2=2, SR3=3, PSR1=50, PSR2=50,
PSR3=100;
ADD RT: R=2, RN="Except SRT_3", SRST=PERC, SR1=1, SR2=2, PSR1=50, PSR2=50;
```

//Add two route analysis data. Set route selection code to 0, caller category to "priority" and "all categories" respectively, and route number to 1 and 2 respectively.

```
ADD RTANA: RSC=0, RSSC=0, RUT=PRI, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=1,
ISUP=NOCHG;
ADD RTANA: RSC=0, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=2,
ISUP=NOCHG;
```

📖 **Note:**

When the call processing software is implementing route analysis, if the parameter "caller category" in several pieces of route analysis data can match the current call, the parameter value "all categories" enjoys the least priority for analysis.

IV. Example 3 (routing based on address indicator)

Suppose there are two toll offices in a city for transiting all toll calls originated locally. See Figure 5-11 for the networking model.
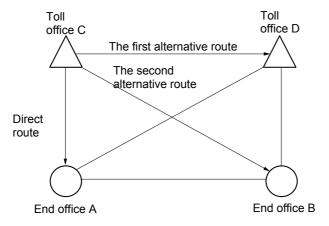
Figure 5-11 Route for toll calls from toll office C to end office A

SoftX3000 serves as toll office C, and it has direct routes to end offices A, B and C in the local network. SoftX3000 routes toll calls to end office A as follows:

1) National toll calls: Select the direct route (C→A) in priority, and then the first alternative route (C→D→A).
2) International toll calls: Select the direct route (C→A) in priority, and then the first alternative route (C→D→A), and finally the second alternative route (C→B→A).

//Add three office directions. The office direction from the local office to end office A is numbered 231, that from the local office to end office B is numbered 232, and that from the local office to toll office D is numbered 233.

```
ADD  OFC:  O=231,  ON="To  Office_A",  DOT=CC,  DOL=LOW,  DPC1="1122aa",
METHOD=NOCONV;
ADD  OFC:  O=232,  ON="To  Office_B",  DOT=CC,  DOL=LOW,  DPC1="1122bb",
METHOD=NOCONV;
ADD  OFC:  O=233,  ON="To  Office_D",  DOT=CMPX,  DOL=SAME,  DPC1="1122cc",
METHOD=NOCONV;
```

//Add three sub-routes numbered 231, 232 and 233 respectively. 231 is a sub-route from office C to office A, 232 is a sub-route from office C to office B, and 233 is a sub-route from office C to office D.

```
ADD SRT: SRC=231, O=231, SRN="To Office_A", TSM=CYC;
ADD SRT: SRC=232, O=232, SRN="To Office_B", TSM=CYC;
ADD SRT: SRC=233, O=233, SRN="To Office_D", TSM=CYC;
```

//Add two routes numbered 232 and 233 respectively. All sub-routes of route 232 can be used for outgoing calls, while the second alternative sub-route of route 233 is prohibited from being used for outgoing calls.

```
ADD RT: R=232, RN="For all SRT", SRST=SEQ, SR1=231, SR2=233, SR3=232;
ADD RT: R=232, RN="Except alt-SRT", SRST=SEQ, SR1=231, SR2=233;
```

//Add two route analysis data, with route selection code as 231, address information indicator as "international toll" and "all categories" respectively, and route number as 232 and 233 respectively.

```
ADD RTANA: RSC=231, RSSC=0, RUT=ALL, ADI=INTT, CLR=ALL, TP=ALL, TMX=0, R=232,
ISUP=NOCHG;
ADD RTANA: RSC=231, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=233,
ISUP=NOCHG;
```

 Note:

When the call processing software is implementing route analysis, if the parameter "address information indicator" in several pieces of route analysis data can match the current call, the parameter value "all categories" enjoys the least priority for analysis.

5.5 Configuring Trunk Data

5.5.1 Configuring Single PCM Port to Bear Data of Multiple Trunk Groups (Same Office Direction)

I. Introduction

To facilitate carriers to independently manage attributes of outgoing and incoming trunk groups, do not configure trunk circuits of the same office direction to bi-directional circuits in the actual networking. Configure them to unidirectional circuits such as outgoing and incoming trunk groups according to specified proportion.
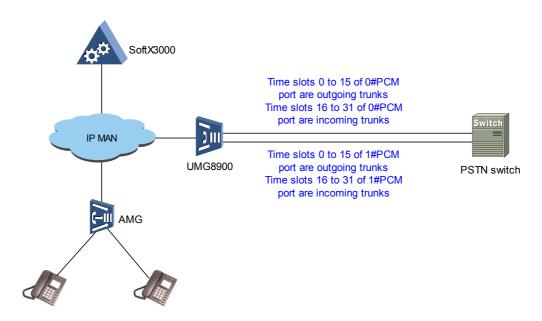
Generally, many E1 trunk circuits are configured between two offices (for example, more than eight E1 trunk circuits), you can configure the trunk circuits to outgoing and incoming trunk groups based on E1. In this way, when an E1 circuits is faulty, its impact on the traffic between the offices is limited and tolerable.

When few E1 trunk circuits are configured between two offices (for example, less than four E1 circuits), and you still configure the trunk circuits to outgoing and incoming trunk groups based on E1, problems may happen. When an E1 circuits is faulty, it affects the traffic between the offices and is intolerable.

Therefore, when few E1 trunk circuits are configured between two offices, configure the trunk circuits of the same office direction to outgoing and incoming trunk groups based on time slots to ensure the reliability of the transmission networking. For single PCM port, configure some slots to outgoing trunk groups and other slots to incoming trunk groups.

II. Example 1 (ISUP trunk)

Suppose that two E1 trunk circuits are configured between the SoftX3000 of the local office and a PSTN switch, and ISUP signaling is used between offices. The system networking is as shown in Figure 5-12.

Figure 5-12 Typical networking when configuring single PCM port to bear data of multiple trunk groups (same office direction)

Configure the data on the SoftX3000 as follows: Configure the time slots from 0 to 15 of the physical port of the 0#PCM of the UMG8900 and those of the 1#PCM to outgoing trunks. Configure the time slots from 16 to 31 of the physical port of the 0#PCM of the UMG8900 and those of the 1#PCM to incoming trunks.

//Add a UMG8900. Set equipment ID to 211.169.150.95:2944.

```
ADD MGW: EID="211.169.150.95:2944", GWTP=TG, MGWDESC="Shenzhen-UMG8900-03",
MGCMODULENO=22, LA="191.169.150.30", RA1="211.169.150.95", RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

//Add an MTP DSP. Set DSP index to 201, indicating PSTN switch.

```
ADD N7DSP: DPX=201, DPC="110033", DPNAME="E_office", STPF=FALSE, ADJF=TRUE;
```

//Add an office direction to the PSTN switch. Set office direction number to 201 and destination point code (DPC) to 110033.

```
ADD  OFC:  O=201,  ON="E_office",  DOT=CMPX,  DOL=LOW,  DPC1="110033",
METHOD=NOCONV;
```

//Add a sub-route. Set sub-route number to 201.

```
ADD SRT: SRC=201, O=201, SRN="To E_office", TSM=CYC;
```

//Add a route. Set route number to 201.

```
ADD RT: R=201, RN="To E_office", SR1=201;
```

//Add analysis data of a route to the PSTN switch. Set route selection code to 201.

```
ADD RTANA: RSC=201, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=201,
ISUP=NOCHG;
```

//Add a No. 7 trunk group. Trunk group number 201 is an outgoing trunk group, and trunk group number 202 is an incoming trunk group.

```
ADD  N7TG:  TG=201,  EID="211.169.150.95:2944",  G=OUT,  SRC=201,  TGN="To
E_office", CT=ISUP, RCHS=255, OTCS=99;
ADD N7TG: TG=202, EID="211.169.150.95:2944", G=IN, SRC=201, TGN="To E_office",
CT=ISUP, RCHS=88, OTCS=255;
```

📖 **Note:**

- For outgoing trunk groups, the "Charging source code" parameter is set to 255, and the "Outgoing trunk charging source code" parameter cannot be set to 255 (it is set to 99 here).
- For incoming trunk groups, the "Charging source code" parameter cannot be set to 255 (it is set to 88 here), and the "Outgoing trunk charging source code" parameter is set to 255 .

//Add No. 7 trunk circuits. The physical port is the port of 0# PCM. Circuits from No. 64 to No. 79 are outgoing trunk circuits. Set start circuit identification code (CIC) to 0, start circuit termination ID to 0, and trunk group number to 201. Circuits from No. 112 to No. 127 are incoming trunk circuits. Set start CIC to 16, start circuit termination ID to 16, and trunk group number to 202.

```
ADD N7TKC: MN=22, TG=201, SC=64, EC=79, SCIC=0, SCF=FALSE, TID=0;
ADD N7TKC: MN=22, TG=202, SC=112, EC=127, SCIC=16, SCF=FALSE, TID=16;
```

//Add No. 7 trunk circuits. The physical port is the port of 1# PCM. Circuits from No. 128 to No. 143 are outgoing trunk circuits. Set start circuit identification code (CIC) to 32, start circuit termination ID to 32, and trunk group number to 201. Circuits from No. 176 to No. 191 are incoming trunk circuits. Set start CIC to 48, start circuit termination ID to 48, and trunk group number to 202.

```
ADD N7TKC: MN=22, TG=201, SC=128, EC=143, SCIC=32, SCF=FALSE, TID=32;
ADD N7TKC: MN=22, TG=202, SC=176, EC=191, SCIC=48, SCF=FALSE, TID=48;
```

📖 **Note:**

- When a No. 7 trunk circuit is added, the system allocates the circuit number resources in the FCCU/FCSU module based on E1 by default. No matter what values the start and end circuit numbers are, the circuit number resources from [n x 32] to [m x 32 - 1] are used. N = INT (Start circuit number/32), and m = INT (End circuit number/32) + 1. If you have configured the data of n trunk groups for a PCM physical port, the circuit number resources of n logical PCM ports on the SoftX3000 are used. Part of the circuit number resources is wasted.
- Start CIC is the parameter for interconnecting the SoftX3000 and the PSTN switch. Start circuit termination ID is the parameter for interconnecting the SoftX3000 and the UMG8900. Configure the two parameters according to the actual conditions. The absolute value of the difference between the start circuit number and the start circuit termination ID must be integral multiple of 32, for example, 0, 32, 64, and 96.
- According to the above configuration principles, the key point for configuring single PCM port to bear the data of multiple trunk groups is to define the value of the start circuit number and end circuit number correctly. In this example, the data of two trunk groups is configured for the port of 0# PCM. The first 16 time slots of the port of 0#PCM use the first 16 circuits (from No. 64 to No. 79) of the logical 2#PCM port on the SoftX3000. The last 16 time slots of the port of 0#PCM use the last 16 circuits (from No. 112 to No. 127) of the logical 3#PCM port instead of the first 16 circuits (from No. 96 to No. 111) of the logical 3#PCM port. This applies to other similar cases.

III. Example 2 (R2 trunk)

Suppose that two E1 trunk circuits are configured between the SoftX3000 of the local office and a PSTN switch, and R2 signaling is used between offices. The system networking is as shown in Figure 5-12.

Configure the data on the SoftX3000 as follows: Configure the time slots from 0 to 15 of the physical port of the 0#PCM of the UMG8900 and those of the 1#PCM to outgoing trunks. Configure the time slots from 16 to 31 of the physical port of the 0#PCM of the UMG8900 and those of the 1#PCM to incoming trunks.

// Add a UMG8900. Set equipment ID to 211.169.150.95:2944.

```
ADD MGW: EID="211.169.150.95:2944", GWTP=TG, MGWDESC="Shenzhen-UMG8900-03",
MGCMODULENO=22, LA="191.169.150.30", RA1="211.169.150.95", RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

//Add an office direction to the PSTN switch. Set office direction number to 201

```
ADD OFC: O=201, ON="E_office", DOT=CMPX, DOL=LOW, METHOD=NOCONV;
```

//Add a sub-route. Set sub-route number to 201.

```
ADD SRT: SRC=201, O=201, SRN="To E_office", TSM=CYC;
```

//Add a route. Set route number to 201.

```
ADD RT: R=201, RN="To E_office", SR1=201;
```

//Add analysis data of a route to the PSTN switch. Set route selection code to 201.

```
ADD RTANA: RSC=201, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=201,
ISUP=NOCHG;
```

//Add R2 trunk groups. Trunk group 201 is an outgoing trunk group, and trunk group 202 is an incoming trunk group.

```
ADD N1TG:  TG=201,  EID="211.169.150.95:2944",  G=OUT,  SRC=201,  TGN="To
E_office", RCHS=255, OTCS=99;
ADD N1TG: TG=202, EID="211.169.150.95:2944", G=IN, SRC=201, TGN="To E_office",
RCHS=88, OTCS=255;
```

  Note:

- For outgoing trunk groups, the "Charging source code" parameter is set to 255, and the "Outgoing trunk charging source code" parameter cannot be set to 255 (it is set to 99 here).
- For incoming trunk groups, the "Charging source code" parameter cannot be set to 255 (it is set to 88 here), and the "Outgoing trunk charging source code" parameter is set to 255 .

//Add R2 trunk circuits. The physical port is the port of 0# PCM. Circuits from No. 64 to No. 79 are outgoing trunk circuits. Set start circuit termination ID to 0 and trunk group number to 201. Circuits from No. 80 to No. 95 are incoming trunk circuits. Set start circuit termination ID to 16 and trunk group number to 202.

```
ADD N1TKC: MN=22, TG=201, SC=64, EC=79, SCF=FALSE, TID=0;
ADD N1TKC: MN=22, TG=202, SC=80, EC=95, SCF=FALSE, TID=16;
```

//Add R2 trunk circuits. The physical port is the port of 1# PCM. Circuits from No. 96 to No. 111 are outgoing trunk circuits. Set start circuit termination ID to 32 and trunk group

number to 201. Circuits from No. 112 to No. 127 are incoming trunk circuits. Set start circuit termination ID to 48 and trunk group number to 202.

```
ADD N1TKC: MN=22, TG=201, SC=96, EC=111, SCF=FALSE, TID=32;

ADD N1TKC: MN=22, TG=202, SC=112, EC=127, SCF=FALSE, TID=48;
```

 Note:

When an R2 trunk circuit is added, no special requirements are needed for the above configuration because the system allocates circuit number resources in the FCCU/FCSU module based on time slots.

IV. Example 1 (PRA trunk)

Suppose that two E1 trunk circuits are configured between the SoftX3000 of the local office and a PSTN switch, and DSS1 signaling is used between offices. The system networking is as shown in Figure 5-12.

Configure the data on the SoftX3000 as follows: Configure the time slots from 0 to 15 of the physical port of the 0#PCM of the UMG8900 and those of the 1#PCM to outgoing trunks. Configure the time slots from 16 to 31 of the physical port of the 0#PCM of the UMG8900 and those of the 1#PCM to incoming trunks.

// Add a UMG8900. Set equipment ID to 211.169.150.95:2944.

```
ADD MGW: EID="211.169.150.95:2944", GWTP=TG, MGWDESC="Shenzhen-UMG8900-03",
MGCMODULENO=22, LA="191.169.150.30", RA1="211.169.150.95", RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

//Add an office direction to the PSTN switch. Set office direction number to 201

```
ADD OFC: O=201, ON="E_office", DOT=CMPX, DOL=LOW, METHOD=NOCONV;
```

//Add a sub-route. Set sub-route number to 201.

```
ADD SRT: SRC=201, O=201, SRN="To E_office", TSM=CYC;
```

//Add a route. Set route number to 201.

```
ADD RT: R=201, RN="To E_office", SR1=201;
```

//Add analysis data of a route to the PSTN switch. Set route selection code to 201.

```
ADD RTANA: RSC=201, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=201,
ISUP=NOCHG;
```

//Add ISDN data. Set index to 2 and maximum B channel to 30.

```
ADD ISDNDAT: ISDNX=2, BCHN=30;
```

//Add a PRA subscriber. Set route selection code to 201 and ISDN data index to 2.

```
ADD  PRA: D=K'8780000, P=0, RTSL=201, ISDNX=2, MN=22, CSC=0, RCHS=22,
NS=DDI-1&CLIP-1;
```

//Add PRA trunk groups. Trunk groups 201 and 203 are outgoing trunk groups that use the PRA link No. 10. Trunk groups 202 and 204 are incoming trunk groups that use the PRA link No. 11.

```
ADD  PRATG:  TG=201,  MGW="211.169.150.95:2944",  SRC=201,  LINK=10,
CDEF=K'8780000, TGN="To E_office", GD=OUT;
ADD  PRATG:  TG=202,  MGW="211.169.150.95:2944",  SRC=201,  LINK=10,
CDEF=K'8780000, TGN="To E_office", GD=IN;
ADD  PRATG:  TG=203,  MGW="211.169.150.95:2944",  SRC=201,  LINK=11,
CDEF=K'8780000, TGN="To E_office", GD=OUT;
ADD  PRATG:  TG=204,  MGW="211.169.150.95:2944",  SRC=201,  LINK=11,
CDEF=K'8780000, TGN="To E_office", GD=IN;
```

 Note:

- The difference between adding a PRA trunk group and adding a No. 7 or R2 trunk group: you need to specify the link number of the PRA signaling link that bears the DSS1 signaling message of the PRA trunk group. Therefore, you cannot only configure two PRA trunk groups. You must configure four PRA trunk group in this example.
- The PRA outgoing trunk group and the PRA incoming trunk group that born by a PCM physical port must use the same PRA signaling link. In addition, The time slot used by the PRA signaling link must be within the PCM physical port.

//Add PRA trunk circuits. The physical port is the port of 0# PCM. Circuits from No. 64 to No. 79 are outgoing trunk circuits. Set start circuit termination ID to 0 and trunk group number to 201. Circuits from No. 80 to No. 95 are incoming trunk circuits. Set start circuit termination ID to 16 and trunk group number to 202.

```
ADD PRATKC: MN=22, TG=201, SC=64, EC=79, TID=0;
ADD PRATKC: MN=22, TG=202, SC=80, EC=95, TID=16;
```

//Add PRA trunk circuits. The physical port is the port of 1# PCM. Circuits from No. 96 to No. 111 are outgoing trunk circuits. Set start circuit termination ID to 32 and trunk group number to 203. Circuits from No. 112 to No. 127 are incoming trunk circuits. Set start circuit termination ID to 48 and trunk group number to 204.

```
ADD PRATKC: MN=22, TG=203, SC=96, EC=111, TID=32;
ADD PRATKC: MN=22, TG=204, SC=112, EC=127, TID=48;
```

📖 **Note:**

Pay attention to the number of the PRA trunk group to which the trunk circuit belongs when adding a PRA trunk circuit.

5.5.2 Configuring Single PCM Port to Bear Data of Multiple Trunk Groups (Office Directions)
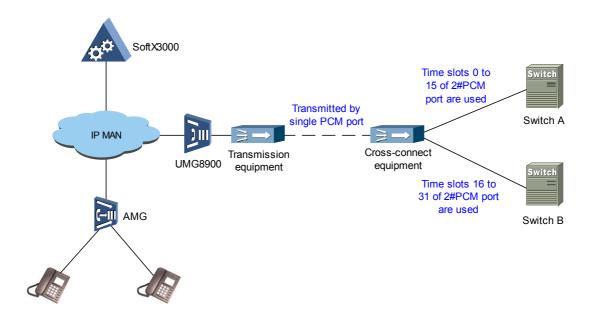
I. Introduction

Because the limitation of the inter-office PCM circuit resources (for example, the networking between switches is through satellite transmission circuits), the number of No. 7 trunk circuits configured between the local office and another office may be less than the number of time slots of a PCM port (for example, only 15 circuits are configured).

For the networking consists of the local office and multiple such offices, the carrier may use cross-connect equipment to combine the trunk circuits into a PCM port that then interconnect the local office through transmission links. In this way, the inter-office PCM circuit resources are saved. For single PCM port, configure some slots to trunk groups of the same office direction and other slots to trunk groups of other office directions.

II. Requirements

Suppose that the SoftX3000 in the local office concurrently interconnects switches A and B through an E1 trunk circuit. ISUP signaling is used between offices. The system networking is as shown in Figure 5-13.

Figure 5-13 Typical networking when configuring single PCM port to bear data of multiple trunk groups (multiple office directions)

Configure the data on the SoftX3000 as follows: Sixteen trunk circuits are configured between the SoftX3000 and switch A. The circuits use time slots 0 to 15 of the physical port of 2#PCM of the UMG8900. Sixteen trunk circuits are configured between the SoftX3000 and switch B. The circuits use time slots 16 to 31 of the physical port of 2#PCM of the UMG8900.

📖 **Note:**

You can configure the data of multiple trunk groups under of multiple office directions for a PCM port only when the single PCM port bears only No. 7 trunk groups.

III. Script

// Add a UMG8900. Set equipment ID to 211.169.150.95:2944.

```
ADD MGW: EID="211.169.150.95:2944", GWTP=TG, MGWDESC="Shenzhen-UMG8900-03",
MGCMODULENO=22, LA="191.169.150.30", RA1="211.169.150.95", RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

//Add two MTP DSPs. Set one DSP index to 202, indicating switch A. Set the other DSP index to 203, indicating switch B.

```
ADD N7DSP: DPX=202, DPC="110055", DPNAME="F_office", STPF=FALSE, ADJF=TRUE;
```

```
ADD N7DSP: DPX=203, DPC="110066", DPNAME="G_office", STPF=FALSE, ADJF=TRUE;
```

//Add two office directions. Set one office direction number to 202, indicating the office direction from the local office to switch A. Set the other office direction number to 203, indicating the office direction from the local office to switch B.

```
ADD  OFC:  O=202,  ON="F_office",  DOT=CMPX,  DOL=LOW,  DPC1="110055",
METHOD=NOCONV;
ADD  OFC:  O=203,  ON="G_office",  DOT=CMPX,  DOL=LOW,  DPC1="110066",
METHOD=NOCONV;
```

//Add two sub-routes. Set sub-route number to 202 and 203 respectively.

```
ADD SRT: SRC=202, O=202, SRN="To F_office", TSM=CYC;
ADD SRT: SRC=203, O=203, SRN="To G_office", TSM=CYC;
```

//Add two routes. Set route number to 202 and 203 respectively.

```
ADD RT: R=202, RN="To F_office", SR1=202;
ADD RT: R=203, RN="To G_office", SR1=203;
```

//Add analysis data of routes to the PSTN switches. Set route selection code to 202 and 203 respectively.

```
ADD RTANA: RSC=202, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=202,
ISUP=NOCHG;
ADD RTANA: RSC=203, RSSC=0, RUT=ALL, ADI=ALL,CLR=ALL, TP=ALL, TMX=0, R=203,
ISUP=NOCHG;
```

//Add No. 7 trunk groups. Trunk group 202 is a bi-directional trunk from the local office to switch A. It belongs to sub-route 202. Trunk group 203 is a bi-directional trunk from the local office to switch B. It belongs to sub-route 203.

```
ADD N7TG:  TG=202,  EID="211.169.150.95:2944",  G=INOUT,  SRC=202,  TGN="To
F_office", CT=ISUP, RCHS=88, OTCS=99;
ADD N7TG:  TG=203,  EID="211.169.150.95:2944",  G=INOUT,  SRC=203,  TGN="To
G_office", CT=ISUP, RCHS=88, OTCS=99;
```

//Add No. 7 trunk circuits. The physical port is the port of 2# PCM. Circuits from No. 64 to No. 79 belong to trunk group 202. Set start CIC to 0 and start circuit termination ID to 64. Circuits from No. 112 to No. 127 belong to trunk group 203. Set start CIC to 0 and start circuit termination ID to 80.

```
ADD N7TKC: MN=22, TG=202, SC=64, EC=79, SCIC=0, SCF=FALSE, TID=64;
ADD N7TKC: MN=22, TG=203, SC=112, EC=127, SCIC=0, SCF=FALSE, TID=80;
```

📖 **Note:**

- The system allocates the circuit number resources in the FCCU/FCSU module based on E1 by default. No matter what values the start and end circuit numbers are, the circuit number resources from [n x 32] to [m x 32 - 1] are used. N = INT (Start circuit number/32), and m = INT (End circuit number/32) + 1. If you have configured the data of n trunk groups for a PCM physical port, the circuit number resources of n logical PCM ports on the SoftX3000 are used. Part of the circuit number resources is wasted.
- Start CIC is the parameter for interconnecting the SoftX3000 and the PSTN switch. Start circuit termination ID is the parameter for interconnecting the SoftX3000 and the UMG8900. Configure the two parameters according to the actual conditions. The absolute value of the difference between the start circuit number and the start circuit termination ID must be integral multiple of 32, for example, 0, 32, 64, and 96.
- According to the above configuration principles, the key point for configuring single PCM port to bear the data of multiple trunk groups is to define the value of the start circuit number and end circuit number correctly. In this example, the data of two trunk groups is configured for the port of 2#PCM. The first 16 time slots of the port of 2#PCM use the first 16 circuits (from No. 64 to No. 79) of the logical 2#PCM port on the SoftX3000. The last 16 time slots of the port of 2#PCM use the last 16 circuits (from No. 112 to No. 127) of the logical 3#PCM port instead of the first 16 circuits (from No. 96 to No. 111) of the logical 3#PCM port.

5.6 Configuring Number Analysis Data

5.6.1 Digit Map Data

I. Introduction

As a number collection rule descriptor, a digit map is a dialing plan saved in MGW and used to detect and report the dial-up events received by terminals. Digit map aims to improving the efficiency of sending called number by MGW, that is, if a called number complies with one of the dialing plans defined in the digit map, MGW will send the called number in a message.

The format of digit map is strictly defined in MGCP or H.248. For the meaning of digits and characters, refer to Chapter 11, "Configuring Number Analysis Data", in *U-SYS SoftX3000 SoftSwitch System Operation Manual-Configuration Guide*.

II. Cautions

1) SoftX3000 supports a digit map composed of 1024 characters at most. However, the maximum length of the digit map during actual configuration cannot exceed the length supported by IAD or AMG.

2) Besides the length of the digit map, some IADs also have limitations on the quantity of delimiters supported. For example, if no more than 10 delimiters are supported, you need simplify the configuration of digit map.

3) If Centrex subscribers are connected to MGW, SoftX3000 will automatically generate a digit map for Centrex subscribers based on the out-group call prefix and intra-group call prefix of the Centrex group.

III. Example

The configuration of digit map is closely related to the numbering plan of PSTN, length of various numbers, prefix of different kinds of calls and dialing habits of subscribers. Suppose it is required to modify the digit maps defined in MGCP and H.248 at SoftX3000 side in a local network to make them conform to the dialing requirements as specified in Table 5-4.

Table 5-4 Digit map configuration requirements

No	Function of digit map	MGCP code	H.248 code	Remark
1	Calling local fixed subscribers	[2-8]xxxxxx	[2-8]xxxxxx	The numbers of local fixed subscribers are composed of 7 digits and prefixed with a digit among 2 to 8.
2	Calling local wireless subscribers	13xxxxxxxxx	13xxxxxxxxx	The numbers of local wireless subscribers are composed of 11 digits and prefixed with 13.
3	Calling non-local wireless subscribers	013xxxxxxxxx	013xxxxxxxxx	When a local subscriber calls a non-local wireless subscriber, "0" should be dialed before the called number. The numbers of non-local wireless subscribers are composed of 11 digits and prefixed with 13.

No	Function of digit map	MGCP code	H.248 code	Remark
4	Dialing international toll prefix	00xxxxxxxx	00xxxxxxxx	When a local subscriber makes an international toll call, "00" should be dialed before the called number. If the international called number is composed of more than 9 digits, the digits after the ninth one will be sent one by one by matching "x.T" or "x.L". If the international called number is composed of less than 9 digits, the caller can end dialing by matching "x.#" or "x.F" (pressing #), or by matching "x.T" or "x.L" (after timeout).
5	Dialing area code of Beijing	010xxxxxxxx	010xxxxxxxx	When a local subscriber makes a national toll call, "0" should be dialed before the called number. The area codes of Beijing is "10". The numbers of local subscribers consists of 8 digits.
6	Dialing area codes of provincial capitals	02xxxxxxxx	02xxxxxxxx	When a local subscriber makes a national toll call, "0" should be dialed before the called number. In China, the area codes of provincial capitals are "02x", and the numbers of local subscribers in each city are composed of 8 digits.

No	Function of digit map	MGCP code	H.248 code	Remark
7	Dialing area codes of other cities	0[3-9]xxxxxxxx	0[3-9]xxxxxxxx	When a local subscriber makes a national toll call, "0" should be dialed before the called number. If the called number is composed of more than 10 digits, the digits after the tenth one will be sent one by one by matching "x.T" or "x.L". If the called number is composed of less than 10 digits, the caller can end dialing by matching "x.#" or "x.F" (pressing #), or by matching "x.T" or "x.L" (after timeout).
8	Dialing special service numbers prefixed with 9x	9xxxx	9xxxx	Generally, the special service numbers prefixed with "9x" consist of 5 digits.
9	Dialing special service numbers prefixed with 1x (excluding 13)	1[0124-9]x	1[0124-9]x	Currently, the special service numbers prefixed with "1x" consist of 3 to 5 digits. If a special service number is composed of more than 3 digits, the digits after the third one will be sent one by one by matching "x.T" or "x.L".
10	Allowing to dial "*" at first	*	E	When a subscriber applies a supplementary service on a DTMF phone set, the prefix is "*" or "#" generally. After "*" is dialed, it will be sent immediately, and the subsequent digits will be sent one by one by matching "*", "#", "x.T" (or "E", "F", "x.L").
11	Allowing to dial "#" at first	#	F	When a subscriber applies a supplementary service on a DTMF phone set, the prefix is "*" or "#" generally. After "#" is dialed, it will be sent immediately, and the subsequent digits will be sent one by one by matching "*", "#", "x.T" (or "E", "F", "x.L").

No	Function of digit map	MGCP code	H.248 code	Remark
12	Allowing to dial "#" at the end of any number to end dialup	x.#	x.F	If "#" is dialed after any digit (0-9) in the numbering plan, it indicates that the dialing is completed, and MGW will send the received digits (including "#") immediately.
13	Allowing to send a number digit by digit or after timeout	x.T	x.L	If a dialed number matches a dialing plan completely, MGW will send the received digits immediately. If there are subsequent digits, they will be sent one by one. If a dialed number only matches a certain dialing plan partially and the subscriber stops dialing the subsequent digits, MGW will send the received digits after timeout.

//Modify the local DN set digit map.

```
MOD LDNSET: LP=0,
DGMAP="[2-8]xxxxxx|13xxxxxxxxx|013xxxxxxxxx|00xxxxxxxxx|010xxxxxxxx|02xxxx
xxxxx|0[3-9]xxxxxxxxx|9xxxx|1[0124-9]x|E|F|x.F|x.L",
MDGMAP="[2-8]xxxxxx|13xxxxxxxxx|013xxxxxxxxx|00xxxxxxxxx|010xxxxxxxx|02xxx
xxxxxx|0[3-9]xxxxxxxxx|9xxxx|1[0124-9]x|*|#|x.#|x.T";
```

 Note:

- Because some GW devices might be case-sensitive to the characters in digit map, it is recommended to write all characters in higher case except "x".
- The syntax rule of digit map defined in MGCP is not the same as that defined in H.248. For example, in H.248, "E" stands for "*", and "F" stands for "#".

5.6.2 Release Mode Data

I. Introduction

By default, when the command **ADD CNACLD** is used to add a call prefix, SoftX3000 will set a release mode for the call prefix automatically. This release mode does not differ in service attribute or signaling mode, for it is the default mode for all services and

all signaling modes. If it is required to set a release mode exclusively for a specific service attribute or signaling mode, carry out the **SET RLSMOD** command to set it, which enjoys higher priority than the default mode.

II. Example 1 (for all service attributes or signaling modes)

It is required to set the release mode of such special service calls as police call and fire call to "Called party release" in all cases.

//Add call prefixes.

```
ADD CNACLD: PFX=K'110, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 110";
ADD CNACLD: PFX=K'119, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 119";
```

  Note:

- If the release mode of a call prefix need not differ with service attribute or signaling mode, use the command **ADD CNACLD** to set it.
- As required in the example, set the parameter "Release mode" in the command to "Called party release"

III. Example 2 (for a specific service attribute or signaling mode)

It is required to set the release mode of national toll calls and international toll calls to "Calling party release" when ISUP signaling is used all the way.

//Add call prefixes.

```
ADD  CNACLD:  PFX=K'0,  CSA=NTT,  RSC=0,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="National toll";
ADD  CNACLD:  PFX=K'00,  CSA=ITT,  RSC=0,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="International toll";
```

  Note:

When you add a call prefix with the command ADD CNACLD, if the default setting is adopted, the release mode of the prefix will be "First party release".

//Set the release mode.

```
SET RLSMOD: PFX=K'0, CSA=NTT, ST=IS, RCM=CLRC;
SET RLSMOD: PFX=K'00, CSA=ITT, ST=IS, RCM=CLRC;
```

📖 **Note:**

- If the release mode of a call prefix is required to differ in service attribute or signaling mode, use the command **SET RLSMOD** to set it.
- As required in the example, set the parameters "Service attribute" and "Signaling mode" correctly, and set "Release mode" to "Calling party release".

5.6.3 Caller Number Change Data

I. Introduction

Caller number change refers to the change of address attribute, number, call source attribute, charging attribute, route selection attribute or user type of the callers. SoftX3000 supports three types of caller number change:

1) Number change based on call source: SoftX3000 converts the numbers of all callers (or incoming trunks) subject to a certain call source before analyzing called numbers.
2) Number change based on call prefix: When a number dialed by a subscriber (or sent through an incoming trunk) matches a specific call prefix, SoftX3000 will convert the caller number before analyzing the called number.
3) Number change based on caller prefix: When a caller number sent by the peer office through an incoming trunk matches a specific caller prefix, SoftX3000 will convert the caller number before analyzing the called number.

In actual application, if number change based on call source is required, you can achieve it through discrimination of caller address attribute of a call source; if number change based on call prefix is required, you can achieve it in several ways such as caller analysis, prefix processing, or trunk bearing; if number change based on caller prefix is required, you can implement it only by caller number discrimination.

II. Implementation

SoftX3000 supports to convert caller numbers by the following methods:

1) Discrimination of caller address attribute of a call source (ADD CALLSRC)

Call source can be used to not only define the attribute of callers, but also convert the address attribute of caller numbers by discrimination of caller address attribute of a call source.

2)   Discrimination of caller numbers (ADD CLRDSN)

Caller number discrimination functions in barring incoming trunk calls and converting the call source attribute and charging attribute of incoming trunk calls initiated by specific subscribers. That is, you can define different call source codes and charging source codes for different callers in SoftX3000. After the conversion, the call source codes and charging source codes of these callers will no longer be the default ones for incoming trunk calls.

3)   Analysis of caller information (ADD CNACLR)

Caller analysis can achieve both caller number change and called number change. It mainly functions in converting caller numbers based on different call prefixes or call sources. Different from prefix processing, it can not only change the caller numbers, but also change their attributes such as route selection source code, failure source code, charging source code and user type.

4)   Processing of prefixes (ADD PFXPRO)

Prefix processing can achieve both caller number change and called number change. It mainly functions in converting caller numbers based on different call prefixes and call sources. This method can change caller numbers. That is, during charging, the caller numbers in bills are the numbers after conversion.

5)   Trunk bearing (ADD TGLD)

Trunk bearing functions in achieving both caller number change and called number change. Caller number change is carried out after called number analysis. This method can change both caller numbers and their address attributes. However, it does not affect charging, that is, the caller number in a bill is still the original one.

This section only presents the examples related to change of caller number and caller address attribute. Refer to the subsequent sections for examples of other applications.

III. Example 1 (Change of caller address attribute through discrimination of caller address attribute of a call source)

It is required to meet the following requirements by configuring data at SoftX3000 side: SoftX3000 functions as an end office, and it interconnects with the local call tandem office in the local network through No.7 trunks. When the local call tandem office transfers a national toll call through an incoming trunk to SoftX3000, SoftX3000 will convert the caller number to a valid national number headed with "0".

//Add a call source coded 30 (used for No.7 trunks between SoftX3000 and the local call tandem office).

```
ADD CALLSRC: CSC=30, CSCNAME="For No7 trunk", PRDN=3, ISADRDSG=TNNWZ;
```

📖 **Note:**

To change a caller number in the incoming trunk (subject to a call source) to a valid national number headed with "0", set the parameter "Caller address discrimination" in the above command to "Change to toll number with 0".

//Add two No.7 trunk groups: Trunk group 0 is an outgoing trunk group, trunk group 1 is an incoming trunk group, and their call source code is 30.

```
ADD N7TG: TG=0, EID="191.169.150.80:2944", G=OUT, SRC=0, TGN="To tandem
office", CSC=30;
ADD N7TG: TG=1, EID="191.169.150.80:2944", G=IN, SRC=0, TGN="To tandem office",
CSC=30;
```

📖 **Note:**

- In the above example, you need only set the "Call source code" of the incoming trunk group interconnecting SoftX3000 and the local call tandem office to "30".
- Unless otherwise specified, set the call source code of outgoing trunk group and incoming trunk group to the same value.

IV. Example 2 (Change of caller number through caller analysis)

It is required to meet the following requirements by configuring data at SoftX3000 side: SoftX3000 functions as an end office, and it interconnects with the local call tandem office in the local network through No.7 trunks. When the local call tandem office transfers a call from other end office in the local network through an incoming trunk to SoftX3000, if the caller number is "3331XXX" and the called prefix is "6661", SoftX3000 will convert the caller number to "3XXX", that is, change "3331" in the caller number to "3".

//Add number change data with number change index as 21.

```
ADD DNC: DCX=21, DCT=MOD, DCL=4, ND=K'3;
```

📖 **Note:**

The above command means to change the first 4 digits of the original caller number to one digit "3".

//Add a call prefix 6661.

```
ADD CNACLD: PFX=K'6661, MINL=7, MAXL=7, CHSC=65535,
SDESCRIPTION="Office_666";
```

//Add caller analysis data, with call source as 0, caller number as 3331, call prefix as 6661 and caller number index as 21.

```
ADD CNACLR: CSC=0, CID=K'3331, PFX=K'6661, RDCX=21;
```

 Note:

- The call source code inputted in the above command must be the one to which the incoming trunk group belongs.
- In the above command, the parameter "Calling party number changing index" is set to "21", indicating that SoftX3000 converts the caller numbers complying with the preset conditions through caller analysis.

//Add two No.7 trunk groups. Trunk group 0 is an outgoing trunk group, trunk group 1 is an incoming trunk group, and their call source code is 0.

```
ADD N7TG: TG=0, EID="191.169.150.80:2944", G=OUT, SRC=0, TGN="To tandem
office", CSC=0;
ADD N7TG: TG=1, EID="191.169.150.80:2944", G=IN, SRC=0, TGN="To tandem office",
CSC=0;
```

 Note:

In this example, you can also achieve the application requirements by trunk group bearing. However, this method is not as flexible as caller analysis, for it can only implement number change for a single trunk group.

V. Example 3 (Change of caller number through prefix processing)

It is required to meet the following requirements by configuring data at SoftX3000 side: When any subscriber in the local office makes an IN card call with the card service prefix of 201, the carrier expects to replace the first three digits of the original caller number with "201".

//Add number change data with number change index as 22.

```
ADD DNC: DCX=22, DCT=MOD, DCL=3, ND=K'201;
```

📖 **Note:**

The above command means to change the first 3 digits of the original caller number to "201".

//Add an IN call prefix 201.

```
ADD CNACLD: PFX=K'201, CSTP=IN, CSA=INSVR, MINL=3, MAXL=3, CHSC=65535,
SDESCRIPTION="ACC Service";
```

//Add prefix processing data with call source code as 65534 (wildcard), and call prefix as 201.

```
ADD PFXPRO: CSC=65534, PFX="201", PROCSTART=YES, RDCX=22;
```

📖 **Note:**

- The call source code "65534" is a wildcard indicating all call source codes (applicable to all subscribers).
- In this example, set the parameter "Caller change flag" to "Yes" and "Caller party number change index" to "22".

5.6.4 Called Number Change Data

I. Introduction

SoftX3000 supports two types of called number change:

1) Number change based on call source: SoftX3000 converts the called numbers dialed by all subscribers (or sent through incoming trunks) subject to a certain call source before analyzing them.

2) Number change based on call prefix: When a number dialed by a subscriber (or sent through an incoming trunk) matches a specific call prefix, SoftX3000 will convert the called number before analyzing it.

In actual application, if number change based on call source is required, you can achieve it through discrimination of caller address attribute of a call source; if number change based on call prefix is required, you can achieve it in several ways such as caller analysis, prefix processing, or trunk bearing;

II. Implementation

SoftX3000 supports to change called numbers by the following methods:

1) Number preparation of call source (ADD CALLSRC)

Call source can not only be used to define the attribute of callers, but also convert the called numbers through number preparation. This method is applied in the case that prefixes are different when an office exists in different networks simultaneously. It is prior to other methods and carried out before called number analysis. In terms of charging, the called number in the bill is the one after conversion.

2) Caller Analysis (ADD CNACLR)

Caller analysis can achieve both caller number change and called number change. It mainly functions in converting called numbers based on different call prefixes or call sources. In terms of charging, the called number in the bill is the one after conversion.

3) Prefix processing (ADD PFXPRO)

Prefix processing can achieve both caller number change and called number change. It mainly functions in converting called numbers based on different call prefixes or call sources. In terms of charging, the called number in the bill is the one after conversion.

4) Trunk bearing (ADD TGLD)

Trunk bearing functions in achieving both caller number change and called number change. Called number change is carried out after number analysis, without affecting other attributes such as charging, emergent calling and release mode. In terms of charging, the called number in the bill is still the original one.

III. Example 1 (Change of called number through number preparation of call source)

It is required to meet the following requirements by configuring data at SoftX3000 side: Simplify the one-stage dialing procedure of Advanced Prepaid Service (APS) subscribers and make it as simple as the dialing mode of ordinary subscribers. When serving as a Service Switching Point (SSP), SoftX3000 is required to automatically insert the APS access code ("213" for example) before the called number so as to ensure the successful trigger of APS.

//Add number change data with number change index as 31.

```
ADD DNC: DCX=31, DCT=INS, ND=K'213;
```

 Note:

The above command means to insert three digits "213" before the original called number.

//Add a call source with call source code as 9, prereceive number digits as 3, and number change index as 31.

```
ADD CALLSRC: CSC=9, CSCNAME="APS User", PRDN=3, DCX=31;
```

 Note:

The new call source code is added for APS subscribers, that is, it functions in inserting the APS prefix "213" before the numbers called by APS subscribers of this call source. For example, if an APS subscriber dials "07556540001", SoftX3000 will convert this number to "21307556540001" before sending it to SSP.

//Modify the call source code for numbers from 6540001 to 6540004 to 9.

```
MOD VSBR: D=K'6540001, LP=0, CSC=9;
MOD VSBR: D=K'6540002, LP=0, CSC=9;
MOD VSBR: D=K'6540003, LP=0, CSC=9;
MOD VSBR: D=K'6540004, LP=0, CSC=9;
```

IV. Example 2 (Change of called number through caller analysis)

It is required to meet the following requirements by configuring data at SoftX3000 side: SoftX3000 serves as a local call tandem office, and its junior office A is configured with two number segments: 666XXXX and 668XXXX. To facilitate management of the fault complaint call (special service number "112"), the carrier requests to connect the fault complaint calls made by callers whose numbers are prefixed with "666" to the local number "6540112", and connect the fault complaint calls made by callers whose numbers are prefixed with "668" to the local number "6541112".

//Add number change data with number change index as 35 and 36 respectively.

```
ADD DNC: DCX=35, DCT=MOD, DCP=0, DCL=3, ND=K'6540112;
ADD DNC: DCX=36, DCT=MOD, DCP=0, DCL=3, ND=K'6541112;
```

 Note:

- The first command means to change the first 3 digits of the original called number to "6540112".
- The second command means to change the first 3 digits of the original called number to "6541112".

//Add a call prefix 112.

```
ADD CNACLD: PFX=K'112, MINL=3, MAXL=7, CHSC=65535, SDESCRIPTION="Special
call";
```

  Note:

- To enable call prefix discrimination required in caller analysis, define the call prefix "112" to be discriminated separately.
- If a subscriber of the junior office dials "112", the called number sent to the local office will be still "112" for the junior office does not change this called number. In this example, the minimum number length should be set to "3" in order to enable the local office to receive digits for incoming trunks.
- For called number change through caller analysis, SoftX3000 does not support to re-analyze called numbers. Therefore, set the maximum number length and service attribute of the call prefix "112" correctly according to the new called number after conversion (6540112 and 6541112). In this example, set the parameter "Maximum number length" to "7" and "Service attribute" to "Local".

//Add caller analysis data with call source code as 0.

```
ADD CNACLR: CSC=0, CID=K'666, PFX=K'112, DDCX=35;
ADD CNACLR: CSC=0, CID=K'668, PFX=K'112, DDCX=36;
```

  Note:

- If a subscriber whose number is prefixed with "666" dials "112", SoftX3000 will start the caller analysis program to convert the called number to "6540112" (corresponding to the called number change index "35", and then carry out the subsequent number analysis procedure based on the service attribute defined for the call prefix "112".
- If a subscriber whose number is prefixed with "668" dials "112", SoftX3000 will start the caller analysis program to convert the called number to "6541112" (corresponding to the called number change index "36", and then carry out the subsequent number analysis procedure based on the service attribute defined for the call prefix "112".

V. Example 3 (Change of called number through prefix processing)

It is known from Example 1 that SoftX3000 automatically inserts the APS access code "213" before any number dialed by APS subscribers, and then SSP triggers the IN

service. However, in another case, if a subscriber makes a special service call such as police call, fire call or ambulance call, the carrier expects that SoftX3000 does not insert the APS access code before such special service numbers, but connects these calls by the common service flow.

//Add number change data with number change index as 32.

```
ADD DNC: DCX=32, DCT=DEL, DCL=3;
```

📖 Note:

The above command means to delete the first 3 digits of the original called number.

//Add call prefixes for special services: 110, 119, 120 and 122.

```
ADD CNACLD: PFX=K'110, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 110";
ADD CNACLD: PFX=K'119, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 119";
ADD CNACLD: PFX=K'120, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 120";
ADD CNACLD: PFX=K'122, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 122";
```

//Add prefix processing data with call source code as 9.

```
ADD PFXPRO: CSC=9, PFX="110", CCF=YES, DDCX=32, ISREANA=YES;
ADD PFXPRO: CSC=9, PFX="119", CCF=YES, DDCX=32, ISREANA=YES;
ADD PFXPRO: CSC=9, PFX="120", CCF=YES, DDCX=32, ISREANA=YES;
ADD PFXPRO: CSC=9, PFX="122", CCF=YES, DDCX=32, ISREANA=YES;
```

📖 Note:

- In the above commands, set the parameter "Callee change flag" to "Yes" and "Callee party number change index" to "32".
- No matter whether APS is triggered in the local office or other office, the service type and service attribute of its access code "213"(as a call prefix) are inconsistent with those of the special service prefixes, and SoftX3000 must reanalyze the called number after deleting the prefix "213". In this case, set the parameter "Reanalysis" in the command to "Yes".

VI. Example 4 (Change of called number through prefix processing)

It is required to meet the following requirements by configuring data at SoftX3000 side: During rearrangement of the local number resources, a carrier has changed the numbers "296XXXX" to "836XXXX". However, subscribers are allowed to dial the original numbers prefixed with "296" during a specified period of time.

//Add number change data with number change index as 33.

```
ADD DNC: DCX=33, DCT=MOD, DCL=3, ND=K'836;
```

 Note:

The above command means to change the first 3 digits of the original called number to "836".

//Add call prefixes.

```
ADD CNACLD: PFX=K'836, MINL=7, MAXL=7, CHSC=65535, SDESCRIPTION="Office_836";
ADD CNACLD: PFX=K'296, MINL=7, MAXL=7, CHSC=65535, SDESCRIPTION="Office_296";
```

 Note:

To enable the coexistence of both old and new numbers during a specific period of time, you need define the call prefix for the new number segment, and at the same time reserve the call prefix of the old number segment. If you do not reserve the old one, SoftX3000 will play an announcement indicating number error when a subscriber dials an old number.

//Add prefix processing data with call source code as 0 and call prefix as 296.

```
ADD PFXPRO: CSC=0, PFX="296", CCF=YES, DDCX=33, ISREANA=YES;
```

📖 **Note:**

- Because the number segment "296XXXX" has been deleted, you need define the prefix processing data (or failure processing data) for the prefix "296"; otherwise, SoftX3000 will play an announcement indicating number error.
- In this example, set the parameter "Callee change flag" to "Yes" and "Callee party number change index" to "33".
- To avoid charging error, it is suggested to set the parameter "Reanalysis" in the command to "Yes" when you define the prefix processing table for the call prefix "296".

5.6.5 Caller Number Analysis Data

I. Introduction

Call source code is used to define the call source attributes of the calling subscriber. Multiple call sources (local subscribers or incoming trunks) can share the same call source code, that is, multiple call sources can have the same call source attributes, including route selection source code, fail source code, charging source code.

To modify a call source code is to modify the related attributes of all calling subscribers. However, this method cannot satisfy the application requirements in some special cases. To define different call source attributes (including route selection mode, failure processing mode and charging mode) for a specific type of calling subscribers in the call source, you can use the **ADD CNACLR** command to redefine them.

II. Example (changing route selection source code of calling subscriber)

SoftX3000 serves as a toll office in the local network, and it has two sub-routes to the upper-level toll office. Sub-route 0 is the direct sub-route and sub-route 1 is the alternative sub-route. In normal cases, SoftX3000 occupies sub-route 0 when transiting outgoing toll calls from the local network. Because the number of channels in sub-route 1 is not much, SoftX3000 only permits some special subscribers (prefix is 32310XX or 36921XX) to occupy sub-route 1 to dial such toll prefix 010 or 020 if sub-route 0 is unreachable or congested.

//Add call source with call source code as 35, route selection source code as 0 (default value) and fail source code as 0 (default value).

```
ADD CALLSRC: CSC=35, CSCNAME="For No7 trunk", PRDN=3;
```

📖 **Note:**

The call source is used for the No.7 incoming trunk between the local office and urban call transit office.

//Add No.7 trunk group, with group number as 0 and call source code as 35.

```
ADD N7TG: TG=0, EID="191.169.150.80:2944", G=IN, SRC=0, TGN="To tandem office",
CSC=35;
```

📖 **Note:**

This command defines the call source code of the No.7 trunk group to 35. In normal cases, SoftX3000 will use the default route selection source code 0 of the incoming trunk (belonging to call source 35) when SoftX3000 performs route analysis for all calls of the incoming trunk group.

//Add call prefixes 0, 010 and 020.

```
ADD   CNACLD:   PFX=K'0,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="National toll";
ADD   CNACLD:   PFX=K'010,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="For 010";
ADD   CNACLD:   PFX=K'020,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="For 020";
```

📖 **Note:**

- To discriminate call prefixes in the caller number analysis, you need to define the call prefixes to be discriminated 010 and 020 respectively.
- In normal cases, SoftX3000 selects sub-route 1 for the outgoing toll calls. For this, you can assign the same value to the parameters "route selection source codes" of the call prefixes 0, 010 and 020.

//Add caller number analysis with all call source codes as 35.

```
ADD CNACLR: CSC=35, CID=K'32310, PFX=K'010, RSSC=10;
ADD CNACLR: CSC=35, CID=K'32310, PFX=K'020, RSSC=10;
ADD CNACLR: CSC=35, CID=K'36921, PFX=K'010, RSSC=10;
ADD CNACLR: CSC=35, CID=K'36921, PFX=K'020, RSSC=10;
```

 Note:

The first above command means: When a subscriber in the local network requests SoftX3000 to connect a toll call, SoftX3000 will change the route selection source code of the incoming trunk (belonging to call source 35) to 10 if the calling prefix is 32310 and the call prefix is 010 in the call.

//Add sub-routes from local office to upper-level toll office. (Sub-route 0 is the direct sub-route and sub-route 1 is the alternative sub-route.)

```
ADD SRT: SRC=0, O=0, SRN="Direct route";
ADD SRT: SRC=1, O=0, SRN="Bypass route";
```

//Add routes from local office to upper-level toll office. (Route 0 only contains sub-route 0 and route 1 contains sub-route 0 and sub-route 1.)

```
ADD RT: R=0, RN="Normal route", SRST=SEQ, SR1=0;
ADD RT: R=1, RN="Special route", SRST=PERC, SR1=0, SR2=1, PSR1=100, PSR2=100;
```

 Note:

For route 1, its sub-route selection mode is "Select by percentage". The first sub-route is sub-route 0 and its percentage is "100". The second sub-route is sub-route 1 and its percentage is "100". In this case, the system first selects sub-route 0 according to the mode of route 1. If sub-route 0 is unreachable or congested, the system will select sub-route 1.

//Add route analysis data between local office and upper-level toll office with route selection codes all as 81.

```
ADD RTANA: RSC=81, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=0,
ISUP=NOCHG;
ADD RTANA: RSC=81, RSSC=10, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=1,
ISUP=NOCHG;
```

 Note:

The first command means that when the route selection source is 0, route 0 will be selected. The second command means that when the route selection source is 10, route 1 will be selected.

III. Example (changing fail source code of calling subscriber)

SoftX3000 serves as an end office, and it is interconnected with the urban call transit office in the local network through No.7 trunk. When the urban call transit office transfers an incoming call to the local office through incoming trunk, the local office will perform processing according to the call prefix of the calling subscriber if the local subscriber is busy (the prefixes of local subscribers are 660XXXX or 661XXXX). If the calling subscriber of the opposite office is a fixed subscriber, the local office will send "Subscriber Busy" to the opposite office and release the call. If the call subscriber of the opposite office is a mobile subscriber (the prefix is 13XXXXXXXXX), the local office will send "Address Complete Message" to the opposite office and send "Line Busy" tone to the calling subscriber of the opposite office.

//Add call source with call source code as 36, route selection source code as 0 (default value) and fail source code as 0 (default value).

```
ADD CALLSRC: CSC=36, CSCNAME="For No7 trunk", PRDN=3;
```

 Note:

The call source is used for the No.7 incoming trunk between the local office and urban call transit office.

//Add No.7 trunk group, with group number as 2 and call source code as 36.

```
ADD N7TG: TG=2, EID="191.169.150.89:2944", G=IN, SRC=0, TGN="To tandem office",
CSC=36;
```

 Note:

This command defines the call source code of the No.7 trunk group to 36. In normal cases, SoftX3000 will use the default fail source code 0 of the incoming trunk (belonging to call source 36) when SoftX3000 performs failure processing for all calls of the incoming trunk group.

//Add call prefixes 660 and 661 (used for local calls).

```
ADD CNACLD: PFX=K'660, MINL=7, MAXL=7, CHSC=65535, SDESCRIPTION="Office_660";
ADD CNACLD: PFX=K'661, MINL=7, MAXL=7, CHSC=65535, SDESCRIPTION="Office_661";
```

//Add caller number analysis with all call source codes as 36.

```
ADD CNACLR: CSC=36, CID=K'13, PFX=K'660, FSC=10;
ADD CNACLR: CSC=36, CID=K'13, PFX=K'661, FSC=10;]
```

📖 Note:

The first above command means: When the urban call transit office transfers the incoming calls from other exchange, SoftX3000 will change the fail source code of the incoming trunk (belonging to call source 36) to 10 if the caller number prefix is 13 and the call prefix is 660 in the call.

//Add failure processing data with fail source codes all as 10.

```
ADD CFPRO: PFX=K'660, FCC=DLBS, FSC=10, FPT=SIG, TT=CONG;
ADD CFPRO: PFX=K'660, FCC=DTBS, FSC=10, FPT=SIG, TT=CONG;
ADD CFPRO: PFX=K'661, FCC=DLBS, FSC=10, FPT=SIG, TT=CONG;
ADD CFPRO: PFX=K'661, FCC=DTBS, FSC=10, FPT=SIG, TT=CONG;
```

📖 Note:

The above commands define the failure processing mode when the calling subscriber whose fail source code is 10 calls the called subscriber with prefix 660 or 661 but the called subscriber is busy. Here the processing mode is to send "Line Busy" tone to the calling subscriber in the opposite office.

IV. Example (changing charging source code of calling subscriber)

There are large amount of toll call traffic between the headquarters of a company in city A and its branch in city B, the operator decides to give the company 60% discount for the toll calls between city A and city B. In city A, it is required to perform separate billing for the toll calls of the company (subscriber number segment is 369XXXX) to city B (toll call prefix is 021) at the toll office side (SoftX3000).

//Add destination code charging with charging selection code as 0, caller charging source code as 0, and charging case as 0 (suppose that the charging case 0 has existed).

```
ADD CHGIDX: CHSC=0, RCHS=0, LOAD=ALL, CODEC=ALL, CHA=0;
```

//Add No.7 trunk group, with group number as 4 and charging source code as 0.

```
ADD N7TG: TG=4, EID="191.169.150.90:2944", G=IN, SRC=0, TGN="To tandem office",
RCHS=0;
```

📖 **Note:**

This command defines the charging source code of the No.7 trunk group to 0. In normal cases, SoftX3000 will use the default charging source code 0 of the incoming trunk when SoftX3000 performs incoming trunk charging for all calls of the incoming trunk group.

//Add call prefixes 0 and 021 with charging selection codes all as 0.

```
ADD   CNACLD:   PFX=K'0,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="National toll";
ADD   CNACLD:   PFX=K'021,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="For 021";
```

📖 **Note:**

To discriminate call prefixes in the caller number analysis, you need to define the call prefix to be discriminated 021 separately.

//Add caller number analysis with caller number as 369, call prefix as 021 and charging source code as 10.

```
ADD CNACLR: CSC=0, CID=K'369, PFX=K'021, CSCH=10;
```

📖 **Note:**

The above command means: When the urban call transit office transfers the incoming toll calls from other exchange, SoftX3000 will change the charging source code of the incoming trunk to 10 if the caller number prefix is 369 and the call prefix is 021 in the call.

//Add destination code charging with charging selection code as 0, caller charging source code as 10, and charging case as 1 (suppose that the charging case 1 has existed).

```
ADD CHGIDX: CHSC=0, RCHS=10, LOAD=ALL, CODEC=ALL, CHA=1;
```

📖 **Note:**

The above command defines that the calling subscriber whose charging source code is 10 will be charged in the charging mode specified in charging case 1 when he/she dials the subscriber with prefix 021 (charging selection code is 0).

V. Example (changing subscriber category of calling subscriber)

SoftX3000 serves as an end office and subscribers 23510XX are special subscribers in the local office. SoftX3000 temporarily changes the caller category of these special subscribers to "Priority" when they dial subscribers with prefix 010 to ensure that they have high priority to select routes when they dial 010.

//Add call prefixes 0 and 010.

```
ADD   CNACLD:   PFX=K'0,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="National toll";
ADD   CNACLD:   PFX=K'010,   CSA=NTT,   RSC=81,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="For 010";
```

📖 **Note:**

To discriminate call prefixes in the caller number analysis, you need to define the call prefix 010 separately.

//Add caller number analysis, with caller number as 2351, call prefix as 010 and caller category as "Priority".

```
ADD CNACLR: CSC=0, CID=K'2351, PFX=K'010, CAT=PRI;
```

📖 **Note:**

After this command is executed, SoftX3000 will temporarily change the caller category of subscribers 23510XX to "Priority" when these subscribers dial 010.

5.6.6 Prefix Processing Data

I. Introduction

In normal cases, the caller number and the dialed number can be directly used for number analysis and call proceeding. However, in some special cases, you need to use the **ADD PFXPRO** command to perform corresponding processing to the caller numbers or called numbers with some specific call prefixes. This is the prefix processing, after which the system can continue the subsequent number analysis or call proceeding. These special cases include:

- For some specific call prefixes, it is required to change the caller number to mask the real number of the caller. For detailed information, see examples in Section 5.6.3 Caller Number Change Data of this chapter.
- The call prefix is but a access code, and it is required to perform corresponding number change to the called number before call proceeding.
- The call prefix is only used for playing tones in the local office, for example, time report tone, number change notice tone and so on.
- For some specific call prefixes, it is required to manually set them into corresponding failure processing. For detailed information, see examples in Section 5.6.7 Failure Processing Data in this chapter.

It should be mentioned: If you define multiple prefix processing modes at the same time, the system will only select one of them according to the priority sequence of "Number change", "Send tone/Inter-digit send tone", "Fail processing" and "Reanalysis". "Number change" can be used together with "Inter-digit send tone" and "Reanalysis".

II. Example (changing called number without reanalysis)

SoftX3000 serves as a toll office in the local network, and it accesses the Public Switched Telephone Network (PSTN) through No.7 trunk or accesses the IP telephone network through packet trunk. If a subscriber directly dials the toll call prefix 0, SoftX3000 will connect the call through the PSTN. If a subscriber dials IP access code 17311 before the toll call prefix 0, the local office will connect the call through the IP telephone network. This example requires SoftX3000 to remove the prefix 17311 to make the called number sent from the local office to the IP telephone network not including the IP access code 17311.

//Add number change data with number change index as 51.

```
ADD DNC: DCX=51, DCT=DEL, DCL=5;
```

 Note:

The command means that the system will delete the first five digits of the original number.

//Add call prefixes.

```
ADD  CNACLD:  PFX=K'0,   CSA=NTT,   RSC=0,   MINL=3,   MAXL=24,   CHSC=0,
SDESCRIPTION="PSTN toll";
ADD  CNACLD:  PFX=K'173110,  CSA=NTT,  RSC=1,  MINL=5,  MAXL=24,  CHSC=0,
SDESCRIPTION="IP toll";
```

 Note:

- The first above command define a normal toll call prefix whose route selection code is 0 (suppose the selection route is PSTN route).
- The second above command define a normal toll call prefix whose route selection code is 1 (suppose that the selection route is PSTN route).

//Add prefix processing data with call source code as 0 and call prefix as 173110.

```
ADD PFXPRO: CSC=0, PFX="173110", CCF=YES, DDCX=51
```

 Note:

- Because the called number sent from the local office to the opposite office cannot contain the access code 17311, you need to define prefix processing data for the prefix 173110. Otherwise, when a subscriber dial the prefix 17311, the opposite cannot connect the call.
- In this example, you need to set the parameter "callee change flag" to "Yes" and "callee party number change index" to "51".
- For the call prefix 173110, because its minimum number length, maximum number length, service attribute, route selection code and charging selection code differ much from those of the call prefix 0, you should not select called number reanalysis when defining the prefix processing table. Otherwise, the system will connect the call through PSTN route when a subscriber dials 173110.

III. Example (changing called number with reanalysis)

SoftX3000 serves as an office applied in both the public network and private network. In the public network, its global DN set is 0 and local DN set is 0. In the private network, its global DN set is 1 and local DN set is 10. To unify the dial-up mode, the operator requires that the access code 10 is added ahead of the called number when a subscriber in the private network of the local office calls the subscribers in the public network belonging to the local network, or calls other subscribers in the public network through trunk.

//Add number change data with number change index as 52.

```
ADD DNC: DCX=52, DCT=DEL, DCP=0, DCL=2;
```

📖 **Note:**

The command means that the system will delete the first two digits of the original number.

//Add call prefix for calls for private network calling public network, with local DN set as 10 and call prefix as 10.

```
ADD CNACLD: LP=10, PFX=K'10, MINL=5, MAXL=24, CHSC=65535, SDESCRIPTION="To
PSTN";
```

📖 **Note:**

Because the call prefix must be reanalyzed according to the number analysis data table of the global DN set 0, the parameter "service attribute" in the command must be set to "Local".

//Add prefix processing data with call source code as 10 (support it belongs to private network subscribers), local DN set as 10, call prefix as 10 and new DN set as 0.

```
ADD PFXPRO: CSC=10, LP=10, PFX="10", CCF=YES, NP=0, DDCX=52, ISREANA=YES;
```

📖 **Note:**

- When SoftX3000 serves as an office applied in both the public network and private network, see Chapter 6, "Special Applications", for detailed information about data configuration procedures.
- To implement called number change function, you need to set the parameter "Callee change flag" in the command to "Yes", and set the parameter "callee number change index" to "52".
- For the call prefix 10 of the local DN set 10, because its minimum number length, maximum number length, service attribute, route selection code and charging selection code cannot be used for the subscribers in the private network calling the subscribers in the public network, you should set the parameter "reanalysis" to "Yes" and input "0" for the parameter "new DN set".

IV. Example (sending tone, for example, time report tone)

SoftX3000 serves as an end office and it is configured with embedded Media Resource Server (MRS). The operator requires that when a subscriber dials the prefix 117, the local office can report the current time to the calling subscriber in voice.

//Add call prefix 117, with service category as "Basic service", service attribute as "Local" and charging selection code as "296".

```
ADD CNACLD: PFX=K'117, MINL=3, MAXL=3, CHSC=65535;
```

📖 **Note:**

For this type of call prefix, if the time report tone resources are provided by the MRS controlled by the local office, you need to set the parameter "service attribute" to "Local".

//Add prefix processing data with call prefix as "117", send tone method as "Send tone" and tone type as "117 timer report".

```
ADD PFXPRO: CSC=0, PFX="117", SENDTONE=SDT, TT=CLK117;
```

 📖 **Note:**

- To enable SoftX3000 to play time report tone to the calling subscribers, you need correctly configure the number analysis data and MRS resource data and upload correct audio clips to the MRS.
- It should be mentioned: In the tone playing implemented by the prefix processing mode, the local office will send answer when a calling subscriber or incoming trunk dials corresponding call prefix.

V. Example (sending inter-digit tone, for example, special dial tone)

SoftX3000 serves as an end office, and it provides PSTN toll call service and IP toll call service at the same time in the local network. To discriminate the IP toll call service, the operator defines the dial-up method for the service: First dial the special access prefix 17308 (this prefix is not used for call setup), and then dial 0 plus the called number after hearing the special dial tone.

//Add number change data with number change index as 53.

```
ADD DNC: DCX=53, DCT=DEL, DCL=5;
```

 📖 **Note:**

The command means that the system will delete the first five digits of the original number.

//Add call prefix 17308.

```
ADD  CNACLD:  PFX=K'17308,  CSA=NTT,  RSC=1,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="IP toll";
```

📖 **Note:**

- The above command define a IP toll call prefix whose route selection code is 1. (Suppose that the selection route is IP telephone network route.)
- It should be mentioned: Because the local office needs to delete the prefix 17308, suppose that a subscriber dials 17308-0XXPQRABCD, the system will perform validity check to the minimum number length and maximum number length of the result number after changing the called number. The result number does not contain 17308.

//Add prefix processing data with call source code as 0 and call prefix as 17308.

```
ADD PFXPRO: CSC=0, PFX="173108", CCF=YES, SENDTONE=DSDT, DDCX=53;
```

📖 **Note:**

- To enable SoftX3000 to send special dial tone to the calling subscriber when a subscriber dials 17308, you need to set the parameter "send tone method" in the command to "Inter-digit send tone".
- Because the called number sent from the local office to the opposite office cannot contain the access code 17308, you need to the set the parameter "callee change flag" in the command to "Yes" and the parameter "callee number change index" to "53".
- Because SoftX3000 cannot support tone sending and number reanalysis for a call prefix at the same time, you need to set the parameter "reanalysis" in the command to "No". Otherwise, the system cannot perform the "send tone" prefix processing mode.

5.6.7 Failure Processing Data

I. Introduction

In a dial-up call setup process, the call might be failed due to some causes. If the system does not perform any processing for the failed call, the calling subscriber can only hear the busy tone but cannot know the actual cause for the call failure. In such case, especially when the dialed number is vacant number or wrong number, the subscriber might attempt to dial the number many times after the call failure, which greatly reduces the call completion rate.

When a call or a call proceeding is failed, if the system notifies the subscriber of the failure cause or prompts the subscriber to perform next operation instead of sending busy tone, it will greatly reduce the attempts of calls and increase the call completion rate of the system. For this purpose, you can use the **ADD CFPRO** command to add failure processing mode.

It should be mentioned that the failure processing mode defined for a call prefix by the **ADD CFPRP** command must precisely match the failure cause code. That is, the system will generate a call failure cause code (which can be obtained by the User Status tracing task) if a call is failed after the subscriber dials the prefix. If the failure cause code is completely the same as a failure cause code defined in the failure processing data table (that is, the failure cause code is precisely matched), the system will perform corresponding processing according to the failure processing mode defined in the failure processing data table. You can use the **ADD PFXPRO** command to define the failure processing mode for a call prefix, but the failure processing mode is unconditional. That is, the system will regard the call is failed whenever a subscriber dials the call prefix. In this case, the system can either send busy tone or specify failure cause code and then search for the corresponding failure processing mode in precise matching in the failure processing data table according to the failure cause code.

II. Example (unconditional failure processing, used for playing number change notice tone)

An operator changes all subscribers in the number segment 296XXXX into the number segment 836XXXX. After a period of time, the operator wants the system to guide the calling subscribers calling the number segment 296XXXX. That is, when a subscriber dials the prefix 296, the system neither connects the call to the called subscriber nor charges the call prefix, but plays a notification, for example, "The first digits of the number you dialed has changed to 836, please hang up and dial again".

//Add charging case 200.

```
ADD CHGANA: CHA=200, PAY=NOCHG;
```

 Note:

Though the local office does not charge the prefix 296, it is recommended to define a charging case for the prefix 296 and change the parameter "payer" to "No Charge" to prevent the system generating large amount of charging alarms for no charging case to the prefix.

//Modify charging modes.

```
MOD CHGMODE: CHA=200, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=200, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";

MOD CHGMODE: CHA=200, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add destination code charging with charging selection code as 296, caller charging source code as 254 (wildcard), and charging case as 200.

```
ADD CHGIDX: CHSC=296, RCHS=254, LOAD=ALL, CODEC=ALL, CHA=200;
```

  📖 **Note:**

Because the payer in the charging case 200 is "No Charge", the local office will not generate bill and the system will not generate charging alarm as well when a local subscriber (or incoming trunk) dials the prefix 296.

//Add call prefix 296, with service category as basic service, service attribute as local and charging selection code as 296.

```
ADD CNACLD: PFX=K'296, MINL=3, MAXL=3, CHSC=296;
```

  📖 **Note:**

Because the prefix 296 is used for playing number change notification tone, you can set "minimum number length" and "maximum number length" both to "3" in normal cases.

//Add prefix processing data, with call prefix as 296, failure process flag as "Yes" and failure cause code as "CV_Number_Changed".

```
ADD PFXPRO: CSC=0, PFX="296", FPF=YES, FCC=DNC;
```

📖 **Note:**

- It should be mentioned that: For the tone playing implemented by prefix processing mode, when a calling subscriber or incoming trunk dials corresponding call prefix, the local office will send answer, which will cause the local office or the opposite office to charge the calling subscriber incorrectly. To avoid this case, you need to select failure processing mode in the prefix processing table.
- For the failure cause code in the command, you can customize it. But the failure cause code that you select in the failure processing data table must be the same as the one you customized. Here the value is "CV_Number_Changed".

//Add failure processing data with failure cause code as "CV_Number_Changed", fail source code as "254" (wildcard), processing type as "Send signal tone", and signal tone type as "Number changed notice tone".

```
ADD CFPRO: FCC=DNC, FSC=254, FPT=SIG, TT=CHGDIAL, SAS=NO;
```

📖 **Note:**

- The fail source code 254 is a wildcard indicating all fail source codes. It is applicable for all subscribers or incoming trunks.
- When a subscriber or incoming trunk dials the corresponding call prefix, the local office will not send answer to the calling subscriber or the opposite office to prevent the local office or the opposite office charge the calling subscriber incorrectly. In this case, the parameter "send answer signal" in the command is set to "No".
- It should be mentioned: The tone here is the standard number change notice tone. If you want customized notice tone, see related contents in Chapter 6, "Special Applications".

III. Example (conditional failure processing, used for playing vacant number tone and wrong number tone)

SoftX3000 serves as an end office. The local office occupies the number resources 87XXXXXX, and the available number segment is 878XXXXX. To improve the call completion rate, the operator determines to carry on the following measure: When a subscriber calls a subscriber belonging to the local office, the system will send the tone "The subscriber you dial is busy" if the called subscriber is busy, "The subscriber you dial cannot be connected temporarily" if the called subscriber does not reply, "The number you dial is vacant" or "The number you dial is wrong".

//Add call prefix 87.

```
ADD CNACLD: PFX=K'87, MINL=8, MAXL=8, CHSC=65535;
```

//Add failure processing data with call prefixes all as 87 and send answer signal as "No".

```
ADD CFPRO: PFX=K'87, FCC=BUSY, FSC=254, FPT=SIG, TT=TSTE;
ADD CFPRO: PFX=K'87, FCC=NUA, FSC=254, FPT=SIG, TT=SPS;
ADD CFPRO: PFX=K'87, FCC=IDF, FSC=254, FPT=SIG, TT=NODN;
ADD CFPRO: PFX=K'87, FCC=NADN, FSC=254, FPT=SIG, TT=ERDN;
```

 Note:

- The fail source code 254 is a wildcard indicating all failure source codes. It is applicable for all subscribers or incoming trunks.
- The parameter "fail cause code" in the command must be correctly defined. If you are not sure which failure cause code is used, simulate a failed call and use the User Status tracing task on the maintenance console to obtain the related failure cause code.

IV. Example (conditional failure processing, used for reselecting route)

SoftX3000 serves as a toll office in the local network, and it has two sub-routes to the opposite toll office. Sub-routes 0 and 1 are both direct sub-routes. The sub-routes at SoftX3000 side are selected by percentage, and the percentage of each sub-route is 50%. To improve the call completion rate, the operator requires that the system can select the next sub-route when SoftX3000 selects sub-route successfully but fails to occupy trunk (for example the remote device is congested or the trunk is occupied bi-directionally).

//Add call source with call source code as 51 and fail source code as 51.

```
ADD CALLSRC: CSC=51, CSCNAME="To toll", PRDN=3, FSC=51;
```

 Note:

The call source is used for the No.7 trunk between the local office and the opposite toll office.

//Add failure processing data with fail source code as 51 (corresponding to the trunk between local office and opposite toll office) and processing type as "Re-select route".

```
ADD CFPRO: FCC=FSCW, FSC=51, CSA=NTT, FPT=RSRT;
ADD CFPRO: FCC=FSCW, FSC=51, CSA=ITT, FPT=RSRT;
ADD CFPRO: FCC=TDUSD, FSC=51, CSA=NTT, FPT=RSRT;
ADD CFPRO: FCC=TDUSD, FSC=51, CSA=ITT, FPT=RSRT;
```

📕 **Note:**

- For description purpose, this example only shows two kinds of failure cause codes, including remote device congestion and bidirectional occupancy. In the actual applications, if you are not sure which failure cause code is used, simulate a failed call and use the User Status tracing task on the maintenance console to obtain the related failure cause code.
- Because the local office serves as a toll office, the command defines the service attribute for starting the failure processing, that is, the system starts failure processing when a call is national toll call or international toll call.

//Add sub-routes from local office to opposite toll office.

```
ADD SRT: SRC=0, O=0, SRN="Direct route";
ADD SRT: SRC=1, O=0, SRN="Bypass route";
```

//Add route from local office to opposite toll office.

```
ADD RT: R=0, RN="To toll", SRST=PERC, SR1=0, SR2=1, PSR1=50, PSR2=50;
```

📕 **Note:**

In this example, the sub-route selection mode is "Select by percentage". The first sub-route is sub-route 0 and its percentage is "50". The second sub-route is sub-route 1 and its percentage is "50". In this case, the system will select sub-route 0 and sub-route 1 according to the load sharing mode.

V. Example (conditional failure processing, used for reanalyzing changed number)

SoftX3000 serves as an end office in the local network. The subscriber number has seven digits and the office occupies the number segment 85XXXXX. The operator performs number digit expansion for the local network, and the number length is changed from seven digits to eight digits. That is, the offices in the local network have no number with seven digits. The number digit expansion principle is: Add 8 before the

original numbers with first prefixes as 2~5, and add 2 before the original numbers with first prefixes as 6~8. In this case, the new number segment belonging to the local office is 285XXXXX. To reduce the inconvenience due to digit expansion, the operator requires that the calling subscribers can use both the original number and new number to call a subscriber during the transition period.

However, the original numbers 58XXXXX (of other office) in the local network have become 858XXXXX, which might conflict with the original numbers 858XXXXX of the local office. In this case, when a subscriber in the local office dials the prefix 858, there are two options. If the dialed number has eight digits, the local office will connect the call to 58XXXXX through trunk. If the dialed number has seven digits, the local office needs perform called number change to process the call as an intra-office call.

//Modify the digit map configuration of local DN set.

```
MOD LDNSET: LP=0,
DGMAP="[2-8]xxxxxx|13xxxxxxxxx|013xxxxxxxxx|00xxxxxxxxx|010xxxxxxxx|02xxxx
xxxxx|0[3-9]xxxxxxxxx|9xxxx|1[0124-9]x|E|F|x.F|x.L",
MDGMAP="[2-8]xxxxxx|13xxxxxxxxx|013xxxxxxxxx|00xxxxxxxxx|010xxxxxxxx|02xxx
xxxxxx|0[3-9]xxxxxxxxx|9xxxx|1[0124-9]x|*|#|x.#|x.T";
```

📖 **Note:**

- It should be mentioned: In the transition period, to decrease the waiting time when a calling subscriber dials the original 7-digit number, it is recommended to define the length of the dial-up scheme in the digit map used for local network call setup to the number length before digit expansion (that is, seven): [2-8]xxxxxx.
- If the length is defined to eight, when a subscriber dials a 7-digit number, the Integrated Access Device (IAD) or the Access Media Gateway (AMG) will not send the dialed number to SoftX3000 until the digit map timer times out. In this case, SoftX3000 must wait until the digit map timer times out before starting the triggering delay timer, which causes the calling subscriber to wait for a long time after dialing a number.

//Add call prefix with 285 as the intra-office call prefix and 858 as the local call prefix (for outgoing call).

```
ADD   CNACLD:   PFX=K'285,   CSA=LCO,   MINL=8,   MAXL=8,   CHSC=65535,
SDESCRIPTION="285_office";
ADD CNACLD: PFX=K'858, CSA=LC, RSC=16, MINL=8, MAXL=8, CHSC=16, DP=7, DT=3,
SDESCRIPTION="858_office";
```

 Note:

- Because the call prefix 858 is used for outgoing calls, you should correctly define such parameters as service attribute, route selection code and charging selection code in the command.
- For the call prefix 858, the parameter "minimum number length" must be set to 8. If the minimum number length is set to 7, after a subscriber dials a 7-digit number, the system will immediately start number analysis according to the service attribute defined by the call prefix 858, thus it cannot start the triggering delay timer.
- For the call prefix 858, the two parameters "time delay trigger point" and "triggering delay" must be correctly defined. In this example, the parameter "time delay trigger point" must be set to 7 and the parameter "triggering delay" is generally set to 3~5 seconds.

//Add number change data with number change index as 55.

```
ADD DNC: DCX=55, DCT=INS, ND=K'2;
```

 Note:

The above command means that the system inserts 2 before the original numbers.

//Add failure processing data with fail cause code as "Delay for insert number after increase number length".

```
ADD CFPRO: PFX=K'858, FCC=CNF, FSC=0, CSA=LC, FPT=CPA, DCX=55;
```

📖 **Note:**

● The parameter "fail cause code" in the command must be correctly defined. Here the option is "Delay for insert number after increase number length".

● The parameter "processing type" in the command must be "Re-analysis after number change", and the parameter "number change index" must be set to "55".

● Because the service attribute of the call prefix 858 is "local call", the parameter "service attribute" in the command must be "Local" for the purpose of normally starting the corresponding failure processing.

● After the above commands are executed, when a subscriber dials the call prefix 858 and the dialed number is a 7-digit number, the system will insert 2 before the original called number by failure processing mode, and then reanalyze the number according to the number analysis table of local DN set 0. At this time, the system will start the number analysis program according to the related attributes defined by the call prefix 285, that is, the call is an intra-office call with the prefix 285 instead of a local call with the prefix 858.

5.6.8 Trunk Group Bearer Data

I. Introduction

The trunk group bearer data is used to configure the trunk occupancy point, caller number change and called number change of local office related to outgoing trunk calls (that is, outgoing calls).

It should be mentioned that the number change in trunk bearer is conducted after number analysis, so charging will not affected. During number analysis for outgoing trunk, the system first judges whether the length of the dialed number reaches the minimum number length. If not, the system will wait for the other digits. If yes, the system will then judge whether the dialed number reaches the number length defined by the parameter "trunk occupy point". The system will not occupy the opposite trunk through the outgoing trunk until the length of the dialed number reaches the minimum number length defined by the parameter "trunk occupy point".

II. Example (changing contents and address nature of caller number)

SoftX3000 serves as a toll office in the local network, and it is interconnected with the upper-level toll office through No.7 trunk. The operators requires that when the end offices in the local network originate toll calls, the calling subscriber information sent from the end offices to toll office must be subscriber numbers. When the toll office transits outgoing toll calls in the local network, the toll office changes the numbers into

valid national numbers or valid international numbers according to the call prefix and modify the address natures of the calling subscribers correspondingly.

//Add number change data with number change indexes as 60 and 61.

```
ADD DNC: DCX=60, DCT=INS, DCP=0, DAI=NDN, ND=K'755;
ADD DNC: DCX=61, DCT=INS, DCP=0, DAI=IDN, ND=K'86755;
```

📖 **Note:**

- The first command means that the system will insert 755 (national toll zone code) before the original numbers, and change the address nature indicators of the numbers to "National number".
- The second command means that the system will insert 86755 (country code plus national toll zone code) before the original numbers, and change the address nature indicators of the numbers to "International number".

//Add No.7 trunk group from local office to upper-level toll office. Trunk group 40 is the outgoing trunk and trunk group 41 is the incoming trunk.

```
ADD N7TG: TG=40, EID="191.169.150.81:2944", G=OUT, SRC=40, TGN="To toll
office";
ADD N7TG: TG=41, EID="191.169.150.81:2944", G=IN, SRC=40, TGN="To toll
office";
```

//Add trunk group bearer. Bearer index 0 is used for national toll calls and bearer index 1 is used for international toll calls.

```
ADD TGLD: CLI=0, TOP=3, RI=60, EI=0;
ADD TGLD: CLI=1, TOP=5, RI=61, EI=0;
```

 📖 **Note:**

- In this example, bearer index 0 is used for national toll calls. The trunk occupancy point is 3, caller number sending change index is 60, and the callee number sending change index is 0 (indicating no change).
- In this example, bearer index 1 is used for international toll calls. The trunk occupancy point is 5, caller number sending change index is 61, and the callee number sending change index is 0 (indicating no change).
- The requirements in this example can also be accomplished through prefix processing, but this method will affect charging (modifying caller numbers in bills). Therefore, in actual application, the proper method should be adopted depending on the specific requirements of the carrier.

//Add trunk group bearer index (only for outgoing trunk group).

```
ADD TGLDIDX: TG=40, CSC=0, PFX=K'0, CLI=0;
ADD TGLDIDX: TG=40, CSC=0, PFX=K'00, CLI=1;
```

 📖 **Note:**

For outgoing trunk group, you need to define the trunk group bearer index, and separately define the national toll call prefix and internal toll call prefix.

III. Example (changing contents of called number)

SoftX3000 serves as a gateway office at the fixed operator side of a city, and it is interconnected with the gateway office at the mobile operator side of the city through No.7 trunk. The two gateway offices bear all mobile call traffic of the local fixed subscribers. When a fixed subscriber calls a local mobile subscriber, he/she can directly dial the number of the mobile subscriber, for example, 13X0123XXXX. When a fixed subscriber calls a mobile subscriber in other network, he/she needs dial 0 plus the number of the mobile subscriber, for example, 013XXXXXXXX. This example deletes through trunk bearer the digit 0, which is dialed when a PSTN subscriber calls a non-local mobile subscriber, before it is routed to the outgoing trunk.

//Add number change data with number change index as 62.

```
ADD DNC: DCX=62, DCT=DEL, DCP=0, DCL=1;
```

📖 **Note:**

The above command means that the system will delete the first digit of the original number.

//Add No.7 trunk group from local office to opposite gateway office. Trunk group 50 is the outgoing trunk and trunk group 51 is the incoming trunk.

```
ADD N7TG: TG=50, EID="191.169.150.82:2944", G=OUT, SRC=50, TGN="To mobile
office";
ADD N7TG: TG=51, EID="191.169.150.82:2944", G=IN, SRC=50, TGN="To mobile
office";
```

//Add trunk group bearer with bearer index as 2.

```
ADD TGLD: CLI=2, TOP=3, RI=0, EI=62;
```

📖 **Note:**

In this example, the trunk occupancy point is 3, caller number sending change index is 0 (indicating no change), and the callee number sending change index is 62.

//Add trunk group bearer index (only for outgoing trunk group).

```
ADD TGLDIDX: TG=50, CSC=0, PFX=K'013, CLI=2;
```

5.7 Configuring Call Barring Data

5.7.1 Caller Number Discrimination Data

I. Introduction

Caller number discrimination means that the call processing software determines whether to accept or reject a call after validity check and judgment to the address nature, number length and prefix of the caller number sent by the opposite office in the incoming trunk call according to the caller number rule preset in the system.

The caller number discrimination is used to prevent the incoming trunk sending wrong caller numbers. That is, if the caller number sent by the opposite office through the incoming trunk does not conform to the caller number rule preset in the local office, the call will be rejected. For example, a fixed gateway office can set that the caller numbers

sent by the opposite mobile gateway office must be like 13XXXXXXXX, and other caller numbers will be rejected.

II. Example (implementing incoming call barring)

SoftX3000 serves as the gateway office at the fixed operator side, and it is interconnected with the gateway office at the mobile operator side through No.7 trunk. Because the prefixes of the mobile subscriber numbers are like 13X, SoftX3000 is required to reject the incoming calls from the subscriber numbers with prefixes as 2~9 when SoftX3000 transits the calls from the mobile gateway office through incoming trunk.

//Add caller number discrimination groups with group numbers as 10.

```
ADD CLRDSN: DSP=10, CLI=K'2, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'3, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'4, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'5, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'6, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'7, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'8, DAI=UDN, FUNC=NIN;
ADD CLRDSN: DSP=10, CLI=K'9, DAI=UDN, FUNC=NIN;
```

📖 Note:

The same discrimination group number can be configured with multiple caller numbers. That is, you can use the same discrimination group number when you use the **ADD CLRDSN** command several times to add caller number discrimination groups.

//Modify the attributes of No.7 trunk group from local office to mobile gateway office. Trunk group 50 is set as outgoing trunk group, trunk group 51 to incoming trunk group and discrimination group numbers to 10.

```
MOD N7TG: TG=50, DISGRP=10;
MOD N7TG: TG=51, DISGRP=10;
```

 Note:

- During the deployment, to prevent call barring from affecting commissioning the basic function of trunk groups, it is not recommended to index the discrimination group numbers when you use **ADD** commands to add trunk group data. After commissioning the basic functions of trunk groups, you can use the **MOD** commands to configure the corresponding call barring data for the trunk groups.
- To prevent the opposite office originating incoming calls through the outgoing trunk of the local office, it is recommended to define discrimination group numbers for both the incoming trunk and outgoing trunk of the local office.

III. Example (implementing caller number discrimination)

SoftX3000 serves as the gateway office at the fixed operator side, and it is interconnected with the gateway office at the mobile operator side through No.7 trunk. Because the prefixes of the mobile subscriber numbers are like 13X and the number length is 11 digits, SoftX3000 is required to set the number length limit to 11 for the mobile subscriber numbers when SoftX3000 transits the calls from the mobile gateway office through incoming trunk.

//Add caller number discrimination group numbered 10.

```
ADD CLRDSN: DSP=10, CLI=K'13, DAI=UDN, FUNC=DSG, MIN=11, MAX=11;
```

//Modify the attributes of No.7 trunk group from local office to mobile gateway office. Trunk group 50 is set as outgoing trunk group, trunk group 51 to incoming trunk group and discrimination group numbers to 10.

```
MOD N7TG: TG=50, DISGRP=10;
MOD N7TG: TG=51, DISGRP=10;
```

IV. Example (changing caller's call source code)

SoftX3000 serves as the gateway office at the side of the operator A, and it is interconnected with the gateway office at the side of the operator B through No.7 trunk. When SoftX3000 transits the calls from the opposite gateway office through incoming trunk, it is required to define the local mobile callers (suppose that their number segment is 63XXXXX) and local mobile callers (suppose that their number segment is 1330123XXXX) belonging to operator B as different call sources.

//Add call source. Call source code 10 is used for the local fixed callers of operator B, and 11 is used for the local mobile callers of operator B.

```
ADD CALLSRC: CSC=10, CSCNAME="For PSTN", PRDN=3, RSSC=10, FSC=10;
ADD CALLSRC: CSC=11, CSCNAME="For Mobile", PRDN=3, RSSC=20, FSC=20;
```

 Note:

In the above command, the call source codes 10 and 11 have different route selection source codes and fail source codes, based on which you can set different route selection policies, failure processing policies and call barring policies for the fixed callers and mobile callers of operator B.

//Add caller number discrimination group numbered 20.

```
ADD CLRDSN: DSP=20, CLI=K'63, DAI=UDN, FUNC=ATT, CSRC=10;
ADD CLRDSN: DSP=20, CLI=K'1330123, DAI=UDN, FUNC=ATT, CSRC=11;
```

//Modify the attributes of No.7 trunk group from local office to opposite gateway office. Trunk group 60 is set as outgoing trunk group, trunk group 61 to incoming trunk group and discrimination group number to 20.

```
MOD N7TG: TG=60, DISGRP=20;
MOD N7TG: TG=61, DISGRP=20;
```

 Note:

To prevent the opposite office originating incoming calls through the outgoing trunk of the local office, it is recommended to define caller number discrimination group numbers for both the incoming trunk and outgoing trunk of the local office.

V. Example (changing caller's charging source code)

SoftX3000 serves as the toll office, its toll calls to the lower-level end offices are charged at the local office. The operator requires that the toll calls made by the local subscribers in number segment 36331XX are free.

//Add charging case. Charging case 160 is used for the normal charging of incoming trunk, and charging case 161 is used for the charging (free) of local subscribers in number segment 36331XX.

```
ADD CHGANA: CHA=160, CHO=CENACC, PAY=CALLER, CHGT=DETAIL;
ADD CHGANA: CHA=161, CHO=CENACC, PAY=FREE, CHGT=DETAIL;
```

//Modify charging mode.

```
MOD CHGMODE: CHA=160, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=160, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=160, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
MOD CHGMODE: CHA=161, DAT=NORMAL, TS1="00&00", TA1=60, PA1=0, TB1=60, PB1=0,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=161, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=0, TB1=60, PB1=0,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=161, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=0, TB1=60, PB1=0,
AGIO1=100, TS2="00&00";
```

//Add destination code charging. Caller charging source code 60 is used for the normal charging of incoming trunk group of lower-level office and caller charging source code 61 is used for the charging (free) of local subscribers in number segment 36331XX.

```
ADD CHGIDX: CHSC=0, RCHS=60, LOAD=ALL, CODEC=ALL, CHA=160;
ADD CHGIDX: CHSC=0, RCHS=61, LOAD=ALL, CODEC=ALL, CHA=161;
```

//Add caller number discrimination group numbered 30. Caller number is 36331 and charging source code is 61.

```
ADD CLRDSN: DSP=30, CLI=K'36331, DAI=UDN, FUNC=ATT, CHG=61;
```

//Modify attributes of incoming trunk group (No.7 trunk group). The charging source code is 60 and discrimination group number is 30.

```
MOD N7TG: TG=31, RCHS=60, DISGRP=30;
```

 Note:

After the above commands are executed, the default charging source code of No.7 trunk group (group number 31) is 60. If calling subscribers are in number segment 36331XX, their charging source code will be changed to 61 after the system performs caller number discrimination analysis.

VI. Example (changing caller's call barring group number)

SoftX3000 serves as the gateway office at the side of the operator A, and it is interconnected with the gateway office at the side of the operator B through No.7 trunk. When SoftX3000 transits the calls from the opposite gateway office through incoming trunk, it is required to define the calling subscribers in number segment 63XXXXX into the normal call barring group, and define the subscribers in number segments 63011XX, 63012XX and 63013XX as subscribers in the white list.

//Modify attributes of incoming trunk group (No.7 trunk group here as example), with call barring group number as 65534 (for normal call barring group).

```
MOD N7TG: TG=61, LMTGRP=65534;
```

 Note:

After the above command is executed, 65534 is the default call barring group number of the calling subscribers making calls through incoming trunk group 61, that is these calling subscribers are in the normal call barring group.

//Add caller number discrimination group numbered 40, with call barring group number as 60002 (white list).

```
ADD CLRDSN: DSP=40, CLI=K'63011, DAI=UDN, FUNC=ATT, GRP=60002;
ADD CLRDSN: DSP=40, CLI=K'63012, DAI=UDN, FUNC=ATT, GRP=60002;
ADD CLRDSN: DSP=40, CLI=K'63013, DAI=UDN, FUNC=ATT, GRP=60002;
```

5.7.2 Inter-group Call Barring Data

I. Introduction

Inter-group call barring means that the system divides the subscribers, trunks or call prefixes of the local office into different call barring groups, including "caller barring group" and "called barring group", and the system determines whether to accept or reject a call according to the barring relation between the caller barring group and called barring group. It should be mentioned that when the subscribers in a barring group are calling subscribers, the barring group is the caller barring group, and vice versa.

In a word, inter-group call barring is used to define which kinds of callers are allowed to make calls or which kinds of called numbers are restricted.

II. Example (implementing call barring in the local office)

SoftX3000 serves as an end office. The subscribers in number segment 53210XX are special subscribers and other subscribers are ordinary kind. This example requires that the call barring group number of special subscribers is defined as 101, and that of ordinary subscribers as 65534. Table 5-5 shows the inter-group barring relationship.

Table 5-5 Inter-group barring relationship

Caller barring group number	Called barring group number	Call indication
101	101	Call allowed
101	65534	Call allowed
65534	65534	Call allowed
65534	101	Barring call

//Set inter-group call barring indication.

```
SET GRPAC: SRG=101, DRG=101, CI=CENA;

SET GRPAC: SRG=101, DRG=65534, CI=CENA;

SET GRPAC: SRG=65534, DRG=65534, CI=CENA;

SET GRPAC: SRG=65534, DRG=101, CI=CDIS;
```

 Note:

Configure the data according to the inter-group barring relationship shown in Table 5-5.

//Modify attributes of subscribers, that is, to set different call barring group numbers for subscribers according to the requirements.

```
MOB VSBR: SD=K'5320000, ED=K'5329999, LP=0, LMTGRP=65534;
MOB VSBR: SD=K'5321000, ED=K'5321099, LP=0, LMTGRP=101;
```

III. Example (implementing call barring in the gateway office)

SoftX3000 serves as a gateway office. Figure 5-14 shows the networking model of SoftX3000 with other exchanges of the same local operator and gateway offices of other operators.
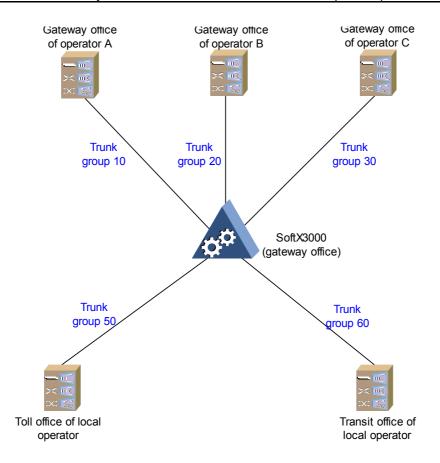
Figure 5-14 Networking model when SoftX3000 serves as gateway office

In normal cases, the local office can transfer the incoming calls from the gateway offices of other operators to the toll office or transit office of the local operator instead of to the gateway offices of other operators. Otherwise, it may bring trouble to the inter-network charging. This example sets call barring data at SoftX3000 side to prohibit call transfer among trunk groups 10, 20 and 30.

//Set inter-group call barring indication. Call barring group number 10 is used for the trunk groups between the local office and gateway office of operator A.

```
SET GRPAC: SRG=10, DRG=20, CI=CDIS;
SET GRPAC: SRG=10, DRG=30, CI=CDIS;
SET GRPAC: SRG=10, DRG=50, CI=CENA;
SET GRPAC: SRG=10, DRG=60, CI=CENA;
```

//Set inter-group call barring indication. Call barring group number 20 is used for the trunk groups between the local office and gateway office of operator B.

```
SET GRPAC: SRG=20, DRG=10, CI=CDIS;
SET GRPAC: SRG=20, DRG=30, CI=CDIS;
SET GRPAC: SRG=20, DRG=50, CI=CENA;
```

```
SET GRPAC: SRG=20, DRG=60, CI=CENA;
```

//Set inter-group call barring indication. Call barring group number 30 is used for the trunk groups between the local office and gateway office of operator C.

```
SET GRPAC: SRG=30, DRG=10, CI=CDIS;
SET GRPAC: SRG=30, DRG=20, CI=CDIS;
SET GRPAC: SRG=30, DRG=50, CI=CENA;
SET GRPAC: SRG=30, DRG=60, CI=CENA;
```

//Set inter-group call barring indication. Call barring group number 50 is used for the trunk groups between the local office and toll office of the local operator.

```
SET GRPAC: SRG=50, DRG=10, CI=CENA;
SET GRPAC: SRG=50, DRG=20, CI=CENA;
SET GRPAC: SRG=50, DRG=30, CI=CENA;
SET GRPAC: SRG=50, DRG=60, CI=CENA;
```

//Set inter-group call barring indication. Call barring group number 60 is used for the trunk groups between the local office and transit office of the local operator.

```
SET GRPAC: SRG=60, DRG=10, CI=CENA;
SET GRPAC: SRG=60, DRG=20, CI=CENA;
SET GRPAC: SRG=60, DRG=30, CI=CENA;
SET GRPAC: SRG=60, DRG=50, CI=CENA;
```

//Modify attributes of trunk groups. Suppose that the groups are all No.7 trunk groups), that is, to define call barring group numbers of trunk groups according to the plan of inter-group call barring.

```
MOD N7TG: TG=10, LMTGRP=10;
MOD N7TG: TG=11, LMTGRP=10;
MOD N7TG: TG=20, LMTGRP=20;
MOD N7TG: TG=21, LMTGRP=20;
MOD N7TG: TG=30, LMTGRP=30;
MOD N7TG: TG=31, LMTGRP=30;
MOD N7TG: TG=50, LMTGRP=50;
MOD N7TG: TG=51, LMTGRP=50;
MOD N7TG: TG=60, LMTGRP=60;
MOD N7TG: TG=61, LMTGRP=60;
```
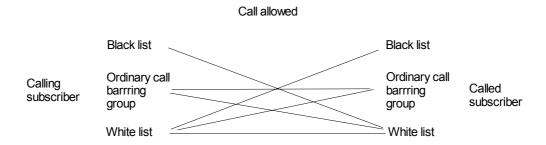
 Note:

- You should define call barring group numbers for both the incoming trunk groups and outgoing trunk groups in the same sub-route. Otherwise, the inter-trunk-group call barring cannot be implemented.
- In this example, trunk group 10 is the outgoing trunk group, and trunk group 11 is the incoming trunk group. Other trunk groups follow this principle.

5.7.3 Black/White List Data

I. Introduction

The black/white list represents a kind of special inter-group call barring relationship. The system has set call barring group numbers 60001 and 60001 respectively for the black list and white list during initialization. In addition, the system has set an ordinary call barring group numbered 65534. Among these call barring groups, there exists fixed call barring relationship as shown in Figure 5-15.

Figure 5-15 Call barring relationship among black list, white list and ordinary call barring group

1) If the calling subscriber is in the black list, he/she can only call the subscribers in the white list.
2) If the calling subscriber in the ordinary call barring group, he/she can call the subscribers in the white list and ordinary call barring group, but cannot call the subscribers in the black list.
3) If the calling subscriber is in the white list, he/she can make calls to anyone.

According to the above call barring relationship, the system defines inter-group call barring indication table for call barring groups 60001, 60002 and 65534, as shown in Table 5-6.

Table 5-6 Call barring relationship among black list, white list and ordinary call barring group

Caller barring group number	Called barring group number	Call indication
60001	60002	Call allowed
60001	65534	Barring call
60002	60001	Call allowed
60002	65534	Call allowed
65534	60002	Call allowed
65534	60001	Barring call

II. Example

SoftX3000 serves as an end office in the army network, and the local subscribers are divided into category-A subscribers, category-B subscribers and category-C subscribers. This example implements call barring among subscribers by black and white lists: Category-A subscribers can call all subscribers, category-B subscribers can call category-A subscribers and category-B subscribers but cannot call category-C subscriber, and category-C subscribers can only call category-A subscribers. Table 5-7 shows the inter-group call barring relationship.

Table 5-7 Inter-group call barring relationship

Caller barring group	Called barring group	Call indication
Category-A subscribers	Category-A subscribers	Call allowed
Category-A subscribers	Category-B subscribers	Call allowed
Category-A subscribers	Category-C subscribers	Call allowed
Category-B subscribers	Category-A subscribers	Call allowed
Category-B subscribers	Category-B subscribers	Call allowed
Category-B subscribers	Category-C subscribers	Barring call
Category-C subscribers	Category-A subscribers	Call allowed
Category-C subscribers	Category-B subscribers	Barring call
Category-C subscribers	Category-C subscribers	Barring call

As shown in Table 5-7, category-A subscribers adopt the white list (60002), category-B subscribers adopts the ordinary call barring group (65534) and category-C subscribers adopt the black list (60001).

5.7.4 Called Number Barring Group Data

I. Introduction

Called number barring is applicable to calls made from local office subscribers defined in the caller barring group to an outgoing call prefix defined in the called barring group. By default, when you add a call prefix using the **ADD CNACLD** command, the system automatically defines the subscribers with that call prefix as the ordinary called barring group (65534) subscribers. According to the black & white lists, the subscribers of the ordinary caller barring group (65534) can dial this call prefix if they have the corresponding call-out authority.

However, limited by the call-out authorities, the system cannot distinguish further classified call prefixes. For example, suppose that 500 call prefixes in an office are set with the "Local call" authority. All subscribers with the "Local call" authority can dial all 500 prefixes if call barring is implemented according to call authority only. This cannot meet the demand of carriers on controlling the call-out authority of a certain type of callers, for example, public telephone subscribers.

If you want to further classify call prefixes, define the corresponding outgoing call prefix in the black list, the white list, or other ordinary call barring groups with the **ADD CLDGRP** command. However, in actual application, you need to set different call barring policies in order to simplify call barring data configuration.

II. Example (implementing call barring by black/white list)

SoftX3000 serves as an ordinary end office in the local network, and it occupies the number segment 368XXXX. The subscribers in the number segment 3685XXX are special subscribers and the other subscribers are ordinary kind. Office S is an army network end office in the local network and it occupies the number segment 281XXXX. The subscribers in the number segment 2810XXX are the category-A subscribers of office S and the other subscribers are category-B subscribers. This example sets that the local ordinary subscribers can only call category-B subscriber of office S instead of category-A subscribers in office S, and that the special subscribers in the local office can call all subscribers (including category-A subscribers) in office S.

//Add call prefix 281 from local office to office S, with service attribute as "Local".

```
ADD CNACLD: PFX=K'281, CSA=LC, RSC=0, MINL=7, MAXL=7, CHSC=0;
```

📖 **Note:**

When you use the **ADD CNACLD** command to add a call prefix, the system will automatically define the called subscribers with the call prefix into the ordinary call barring group (65534) by default. In this example, the called subscribers 281XXXX have been defined as the ordinary call barring group.

//Add called number barring group to define the called numbers 2810XXX (category-A subscribers in office S) as the black list.

```
ADD CLDGRP: CLD=K'2810, GRPT=BG;
```

📖 **Note:**

After the above command is executed, for the call prefix 281, the called subscribers, except those in the number segment 2810XXX, are in the ordinary call barring group.

//Modify attributes of subscribers, that is, to set different call barring group numbers for subscribers according to the requirements.

```
MOB VSBR: SD=K'3685000, ED=K'3685299, LP=0, LMTGRP=60002;
MOB VSBR: SD=K'3680000, ED=K'3680299, LP=0, LMTGRP=65534;
```

📖 **Note:**

According to the call barring principle of the black and white lists, the call barring group number of the special subscribers 3685XXX needs to be defined as 60002 (white list), and ordinary subscribers in the local office defined into the ordinary call barring group (65534).

III. Example (implementing call barring by inter-group barring mode)

SoftX3000 serves as an end office. The subscribers in the number segment 532XXXX in the local office are 201 card subscribers. The card numbers within this range are used to implement campus card services in the colleges belonging to the local office. . To facilitate charging management, the operator needs to perform call barring for all 201 card numbers in the local office, that is, the 201 card subscribers can only dial such prefixes as 200, 201, 300, 110, 119, 120 and 122.

//Add called number barring group to define such call prefixes as 200, 201, 300, 110, 119, 120 and 122 into ordinary call barring group 100.

```
ADD CLDGRP: CLD=K'200, GRPT=OG, GRP=100;

ADD CLDGRP: CLD=K'201, GRPT=OG, GRP=100;

ADD CLDGRP: CLD=K'300, GRPT=OG, GRP=100;

ADD CLDGRP: CLD=K'110, GRPT=OG, GRP=100;

ADD CLDGRP: CLD=K'119, GRPT=OG, GRP=100;

ADD CLDGRP: CLD=K'120, GRPT=OG, GRP=100;

ADD CLDGRP: CLD=K'122, GRPT=OG, GRP=100;
```

//Set inter-group call barring indication. Source call barring group 201 is used for 201 card subscribers.

```
SET GRPAC: SRG=201, DRG=100, CI=CENA;
SET GRPAC: SRG=201, DRG=65534, CI=CDIS;
```

📖 **Note:**

After the above commands are executed, the subscribers in the call barring group 201 can only dial such prefixes as 200, 201, 300, 110, 119, 120 and 122.

//Modify attributes of subscribers. Define call barring group number of 201 card subscribers to 201.

```
MOB VSBR: SD=K'5320000, ED=K'5320319, LP=0, LMTGRP=201;
```

5.7.5 Time-based Call Barring Data

I. Introduction

The time-based call barring is designed specially for Centrex subscribers. The time-based call barring function of SoftX3000 has the following features:

1) The system supports a maximum of four call barring time segments, that is, the system can perform call barring for four time segments in a day.
2) The system can restrict the call-in and call-out authorities of Centrex subscribers at the same time.
3) The system can divide Centrex intra-group subscribers into different call barring groups, that is, the system can perform different call barring policies for different call barring groups in the same Centrex group.

II. Example

To control call charge, a Centrex group requires the operator to perform time-based call barring policy for the intra-group subscribers. Table 5-8 shows the call barring requirements.

Table 5-8 Call barring requirements for Centrex subscribers

Call barring group number	Date category	Start time ~ End time	Barring type
10	Normal workday	00:00 ~ 07:59 18:00 ~ 23:59	All outgoing toll calls
10	Friday	00:00 ~ 07:59 18:00 ~ 23:59	All outgoing toll calls
10	Saturday, Sunday and holidays	00:00 ~ 23:59	All outgoing toll calls

//Add date category.

```
ADD DCAT: MON=JAN, DAY=1, DAT=DTYPE2;
ADD DCAT: MON=FEB, DAY=1, DAT=DTYPE2;
ADD DCAT: MON=FEB, DAY=2, DAT=DTYPE2;
ADD DCAT: MON=FEB, DAY=3, DAT=DTYPE2;
ADD DCAT: MON=MAY, DAY=1, DAT=DTYPE2;
ADD DCAT: MON=MAY, DAY=2, DAT=DTYPE2;
ADD DCAT: MON=MAY, DAY=3, DAT=DTYPE2;
ADD DCAT: MON=OCT, DAY=1, DAT=DTYPE2;
ADD DCAT: MON=OCT, DAY=2, DAT=DTYPE2;
ADD DCAT: MON=OCT, DAY=3, DAT=DTYPE2;
```

 Note:

This example takes Year 2003 and defines the date category of holidays the same as that of Saturday and Sunday.

//Add a Centrex group numbered 8.

```
ADD CXGRP: CGN="ABC", CXG=8, OGP=K'9, DOD2=YES, UCPC=100;
```

//Modify time-based call barring group data. Centrex group number is 8 and call barring group number is 10.

```
ADD LCGRP: CXG=8, LCG=10, DT=NORMAL, CT=COUT, SCO=NTT-1&ITT-1&INTT-1&IITT-1,
ST1="00&00", ED1="07&59", ST2="18&00", ED2="23&59";
ADD LCGRP: CXG=8, LCG=10, DT=DTYPE1, CT=COUT, SCO=NTT-1&ITT-1&INTT-1&IITT-1,
ST1="00&00", ED1="07&59", ST2="18&00", ED2="23&59";
ADD LCGRP: CXG=8, LCG=10, DT=DTYPE2, CT=COUT, SCO=NTT-1&ITT-1&INTT-1&IITT-1,
ST1="00&00", ED1="23&59";
```

 Note:

- The call barring group number here can be configured with multiple date categories. That is, you can use the same call barring group number when you use the **ADD LCGRP** command several times to add time-based call barring groups.
- By default, the date category of Friday is "Category 1" instead of "Normal workday". In this case, when you use the **ADD LCGRP** command, do not regard Friday as "Normal workday".

//Add ESL subscribers (Centrex subscribers).

```
ADB VSBR: SD=K'3331001, ED=K'3331020, LP=0, MN=22, DID=ESL, EID="amg5000.com",
STID=1, CODEC=PCMA, RCHS=65, CSC=1, NS=CLIP-1, CGF=YES, CXG=8, SCXD=K'2001,
COR=ITT-1&IITT-1;
ADB VSBR: SD=K'3331021, ED=K'3331099, LP=0, MN=22, DID=ESL, EID="amg5000.com",
STID=21, CODEC=PCMA, RCHS=65, CSC=1, NS=CLIP-1, CGF=YES, CXG=8, SCXD=K'2021,
LMTGRP=10, COR=ITT-1&IITT-1;
```

 Note:

- Because no call barring relationship is designed for subscriber numbers ranging from 3331001 to 3331020, do not define a call barring group number for them.
- Because call barring relationship is designed for subscriber numbers ranging from 3331021 to 3331099, define a call barring group number, 10 here, for them.

Chapter 6 Special Applications

6.1 Configuring Dual Homing Data

6.1.1 Introduction

I. Requirements

Dual homing is a disaster recovery mechanism to prevent softswitch from breaking down in case any disaster happens. According to Huawei U-SYS solution, the typical networking model for SoftX3000 adopting dual homing mechanism is as shown in Figure 6-1.
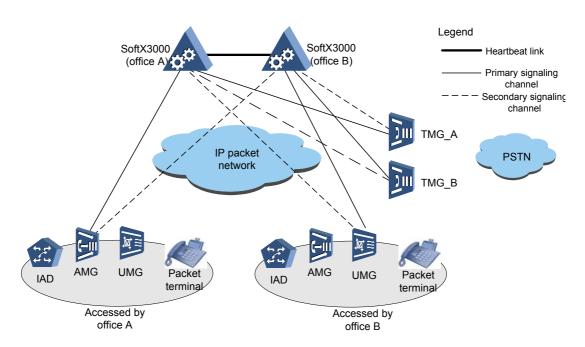
Figure 6-1 Schematic diagram of dual homing solution

Suppose office A provides a number segment 654xxxx and office B provides a number segment 878xxxx. It is required to achieve the following by configuring data at SoftX3000 side:

1) Two SoftX3000s work in automatic-switchover mutual assistance mode.
2) The access devices in office A and TMG_A are primarily controlled by the SoftX3000 in office A and secondarily controlled by the SoftX3000 in office B.

3)   The access devices in office B and TMG_B are primarily controlled by the SoftX3000 in office B and secondarily controlled by the SoftX3000 in office A.

4)   After the dual homing switchover, the telephone number, subscriber attributes, dialing mode, routing mode and charging mode of each subscriber in each office will not change.

II. Data configuration principles

The key principle for configuring dual homing data is to keep consistency and coordination of mutual assistance data between two SoftX3000s in mutual aid. That is, such data as GW registry information, signaling interworking information, trunk interworking information, routing plan, dialing plan, charging plan, number allocation plan and subscriber attributes configured in the primary SoftX3000 are the same as those in the secondary SoftX3000; otherwise, one SoftX3000 cannot take over part or all services of the other SoftX3000 after the dual homing switchover.

To ensure data consistency, comply with the principles as listed in Table 6-1 to configure data:

Table 6-1 Data configuration principles

Data category	Data sub-category	Configuration principle
Equipment information		Configure it based on the actual situation.
Office data	Signaling point code	Configure it based on the actual situation.
	Local DN set	Configure a unique range of the local DN set for each SoftX3000. For example, set the local DN set of office A to ranging from 0 to 9, and that of office B to ranging from 10 to 19.
	Call source code	Configure a unique range of call source codes for each SoftX3000. For example, set the call source codes of office A to ranging from 0 to 49, and those of office B to ranging from 50 to 99.
	Route selection source code	Configure a unique range of route selection source codes for each SoftX3000. For example, set the route selection source codes of office A to ranging from 0 to 9, and those of office B to ranging from 10 to 19.
	Failure source code	Configure a unique range of failure source codes for each SoftX3000. For example, set the failure source codes of office A to ranging from 0 to 9, and those of office B to ranging from 10 to 19.

Data category	Data sub-category	Configuration principle
Office data	Number segment	If multiple area codes are applied, the number segments defined by the two SoftX3000s can be overlapped. If there is only one area code, it is recommended to define a unique number segment for each SoftX3000.
Charging data		To simplify data configuration, it is suggested to configure the same charging data for the two SoftX3000s, including date type, week type, charging case, charging mode, charging source code, outgoing trunk charging source code, charging selection code, and callee charging source code.
MG data		Configure it based on the actual situation.
Media Resource Server (MRS) data		Configure it based on the actual situation.
Protocol data		Configure it based on the actual situation.
Signaling data	MTP DSP index	Configure a unique range of MTP DSP indexes for each SoftX3000. For example, set the MTP DSP indexes of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	M3UA destination entity index	Configure a unique range of M3UA destination entity indexes for each SoftX3000. For example, set the M3UA destination entity indexes of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	SCCP DSP index	Configure a unique range of SCCP DSP indexes for each SoftX3000. For example, set the SCCP DSP indexes of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	SCCP subsystem index	Configure a unique range of SCCP subsystem indexes for each SoftX3000. For example, set the SCCP subsystem indexes of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	ISDN index	To simplify data configuration, it is suggested to configure the same ISDN indexes for the two SoftX3000s.

Data category	Data sub-category	Configuration principle
Signaling data	(built-in) SG ID	Configure a unique range of SG IDs for each SoftX3000. For example, set the SG IDs of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	Linkset number	Configure a unique range of MTP, M3UA, V5UA, and IUA linkset numbers for each SoftX3000. For example, set the MTP linkset numbers of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	Link number	Configure a unique range of MTP, M2UA, M3UA, V5UA, and IUA link numbers for each SoftX3000. For example, set the MTP link numbers of office A to ranging from 0 to 15, and those of office B to ranging from 16 to 31.
Routing data	Office direction number	Configure the same office direction numbers for the two SoftX3000s, that is, the two SoftX3000s have the same office direction number for the same destination, and they have different office direction numbers for different destinations.
Routing data	Sub-route number	Configure a unique range of sub-route numbers for each SoftX3000. For example, set the sub-route numbers of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	Route number	Configure a unique range of route numbers for each SoftX3000. For example, set the route numbers of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	Route selection code	Configure a unique range of route selection codes for each SoftX3000. For example, set the route selection codes of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
Subscriber data		Configure it based on the actual situation.
Trunk data	Trunk group number	Configure a unique range of trunk group numbers for each SoftX3000. For example, set the trunk group numbers of office A to ranging from 0 to 99, and those of office B to ranging from 100 to 199.
Number analysis data	Number change index	To simplify data configuration, it is suggested to configure the same number change indexes for the two SoftX3000s.
	Call prefix	Because the local DN sets have been configured globally, configure call prefixes based on the actual situation.

Data category	Data sub-category	Configuration principle
Centrex data	Centrex group number	Configure a unique range of Centrex group numbers for each SoftX3000. For example, set the Centrex group numbers of office A to ranging from 0 to 999, and those of office B to ranging from 1000 to 1999.
	IP console number	Configure a unique range of IP console numbers for each SoftX3000. For example, set the IP console numbers of office A to ranging from 0 to 4999, and those of office B to ranging from 5000 to 9999.
Call barring data	Caller discrimination group number	Configure a unique range of caller discrimination group numbers for each SoftX3000. For example, set the caller discrimination group numbers of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
	Call barring group number	Configure a unique range of call barring group numbers for each SoftX3000. For example, set the call barring group numbers of office A to ranging from 0 to 127, and those of office B to ranging from 128 to 255.
IN service data	IN charging data	To simplify data configuration, it is suggested to configure the same IN charging data for the two SoftX3000s, including charging discount and charging category.
	IN announcement data	To simplify data configuration, it is suggested to configure the same IN announcement data for the two SoftX3000s, including language bit, language kind and currency.
	SCP number	Configure it based on the actual situation.
Other data		Configure it based on the actual situation.

III. Points for attention

- When the system adopts the dual-homing control mechanism, the number of gateways or that of subscribers under the control of a single softswitch cannot be greater than 50 percent of the maximum capacity of SoftX3000.
- The number of subscribers connected to one FCCU or FCSU should be set to 50% of the total number of subscribers that a local office or a mutual assistance office can carry.
- The number of GWs and SIGTRAN links controlled by one BSGI should be set to 50% of the total number of GWs and SIGTRAN links that a local office or a mutual assistance office can control.
- When both SoftX3000s in offices A and B are interconnected with the SoftX3000 in office C through SIP-T trunks, if the dual homing switchover is carried out due to the fault of the SoftX3000 in office A (the local office), you need to configure

alternative route data in office C to route a call from office C to the original office A's subscriber who is now under the control of office B (mutual assistance office). That is, set the route from office C to office A as a direct route, but that from office C to office B as an alternative route.

- When both SoftX3000s in offices A and B are interconnected with one STP through MTP links directly, if the dual homing switchover is carried out due to the fault of the SoftX3000 in office A (the local office), you need to configure alternative signaling route data in STP to route a signaling message from STP to the original office A's signaling point code that is now under the control of office B (mutual assistance office), that is, set the route from STP to office A as a normal route, but that from STP to office B as an alternative route. In addition, you must set in office B the office B's signaling point code as the mutual assistance node of office A's signaling point code.

6.1.2 Script

To simplify description, the following only presents the main configuration scripts for the SoftX3000 in office A (the local office), because the scripts for the SoftX3000 in office B (mutual assistance office) are similar.

I. Configuring hardware data

//Add two shelves numbered 0 and 1 respectively.

```
ADD SHF: SN=0, LT="SoftX3000", PN=0, RN=0, CN=0, PL=2;
ADD SHF: SN=1, LT="SoftX3000", PN=0, RN=0, CN=1, PL=2;
```

//Add two basic frames numbered 0 and 5 respectively.

```
ADD FRM: FN=0, SN=0, PN=2;
ADD FRM: FN=5, SN=1, PN=3;
```

📖 Note:

To ensure the reliability of dual homing heartbeat links, it is suggested to configure two basic frames and a pair of IFMI boards in each frame.

//Add two pairs of IFMIs. One pair is located in basic frame 0 and the other pair in basic frame 5.

```
ADD BRD: FN=0, SN=0, LOC=FRONT, BT=IFMI, MN=132, ASS=1;
ADD BRD: FN=5, SN=0, LOC=FRONT, BT=IFMI, MN=133, ASS=1;
```

//Add FE port configurations.

```
ADD      FECFG:      MN=132,IP="191.169.150.30",      MSK="255.255.0.0",
DGW="191.169.150.60", EA=AUTO;
ADD      FECFG:      MN=133,IP="191.169.150.31",      MSK="255.255.0.0",
DGW="191.169.150.60", EA=AUTO;
```

II. Configuring dual homing data

//Set the SoftX3000 in the local office to work in mutual aid mode and manual-switchover dual homing mode.

```
SET DHWM: WM=ASSIST, SM=MANUAL, FS=DEACTIVE;
```

📖 Note:

To set the automatic-switchover dual homing mode for the local SoftX3000, do as follows:

- First, execute the command **SET DHWM** to set the working mode of the local SoftX3000 to manual-switchover mutual assistance mode.
- Next, execute the command **ADD DHHCFG** to add dual homing heartbeat links.
- Finally, use the command **SET DHWM** to set the working mode of the local SoftX3000 to automatic-switchover mutual assistance mode.

//Add two dual homing heartbeat links. The IP addresses of the two IFMIs in the mutual assistance office are 191.169.150.40 and 191.169.150.41 respectively.

```
ADD DHHCFG: MN=132, IP="191.169.150.40", KEY="123456";
ADD DHHCFG: MN=133, IP="191.169.150.41", KEY="654321";
```

📖 Note:

Because automatic-switchover mode is adopted between the SoftX3000 in the local office and that in the mutual assistance office, you must configure two heartbeat links between them to ensure the reliability of heartbeat signals.

//Set the dual homing mode.

```
SET DHWM: WM=ASSIST, SM=AUTO, TM=MODE1-1&MODE2-0, HT=20;
```

📖 **Note:**

In the above command, the work mode of the local SoftX3000 is set to "assist work mode", switch mode to "auto switch mode", takeover mode to "deactive -> active", and handshake time to 20 x 10 = 200 seconds.

III. Configuring local office data

//Set the signaling point code of the local office to 001122 (national network).

```
SET OFI: OFN="SoftX3000_A", LOT=CMPX, NN=YES, SN1=NAT, SN2=NAT, SN3=NAT,
SN4=NAT, NPC="001122", NNS=SP24, SPF=YES;
```

//Add the signaling point code of the mutual assistance office, with OPC as 1 and national network code as 001133.

```
ADD OFI: IDX=1, NATC="001133";
```

📖 **Note:**

To achieve mutual assistance between MTP links and M3UA links, you must use the command **ADD OFI** to add in the local office the signaling point code of the mutual assistance office.

//Add two local DN sets. Set the DN set of the local office to 0 and that of the mutual assistance office to 10.

```
ADD LDNSET: LP=0, NC=K'86, AC=K'755, LDN="ShenZhen";
ADD LDNSET: LP=10, NC=K'86, AC=K'756, LDN="ShenZhen";
```

//Add call sources. Set the call source code of the local office to 0 and that of the mutual assistance office to 10.

```
ADD CALLSRC: CSC=0, CSCNAME="Office_A", PRDN=3, LP=0, RSSC=0, FSC=0;
ADD CALLSRC: CSC=10, CSCNAME="Office_B", PRDN=3, LP=10, RSSC=10, FSC=10;
```

📖 **Note:**

Based on the principle for configuring local office data, the call source code, route selection source code and failure source code of the local office must be different from those of the mutual assistance office.

//Add number segment 6540XXX for the local office and 8780XXX for the mutual assistance office.

```
ADD DNSEG: LP=0, SDN=K'6540000, EDN=K'6540999, MSTYPE=MASTER;
ADD DNSEG: LP=10, SDN=K'8780000, EDN=K'8780999, MSTYPE=SLAVE;
```

📖 **Note:**

The parameter "master/slave type" is set differently in the above two commands.

IV. Configuring charging data

//Add charging cases numbered 0, 10 and 20 respectively. Charging case 0 adopts detailed ticket and is used for destination code charging. Charging cases 10 and 20 adopt meter table and are used for intra-office group charging.

```
ADD CHGANA: CHA=0, CHGT=DETAIL;
ADD CHGANA: CHA=10, CHGT=PLSACC, MID=METER1;
ADD CHGANA: CHA=20, CHGT=PLSACC, MID=METER2;
```

//Modify charging modes.

```
MOD CHGMODE: CHA=0, DAT=NORMAL, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=0, DAT=DTYPE1, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="07&00", TA2=6, PA2=1, TB2=6, PB2=1, AGIO2=60, TS3="21&00",
TA3=6, PA3=1, TB3=6, PB3=1, AGIO3=100;
MOD CHGMODE: CHA=0, DAT=DTYPE2, TS1="00&00", TA1=6, PA1=1, TB1=6, PB1=1,
AGIO1=60, TS2="00&00";
MOD CHGMODE: CHA=10, DAT=NORMAL, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=10, DAT=DTYPE1, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=10, DAT=DTYPE2, TS1="00&00", TA1=180, PA1=2, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=20, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=20, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
MOD CHGMODE: CHA=20, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="00&00";
```

//Add intra-office group charging data.

```
ADD CHGGRP: RCHS=65, DCHS=65, LOAD=ALL, CODEC=ALL, CHA=10;
ADD CHGGRP: RCHS=87, DCHS=87, LOAD=ALL, CODEC=ALL, CHA=10;
ADD CHGGRP: RCHS=65, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=20;
ADD CHGGRP: RCHS=87, DCHS=254, LOAD=ALL, CODEC=ALL, CHA=20;
```

//Add destination code charging data. Both the caller charging source codes 65 and 87 are used for destination code charging.

```
ADD CHGIDX: CHSC=0, RCHS=65, LOAD=ALL, CODEC=ALL, CHA=0;
ADD CHGIDX: CHSC=0, RCHS=87, LOAD=ALL, CODEC=ALL, CHA=0;
```

//Add destination code charging data. The caller charging source code 88 is used for the destination code charging of incoming trunk group, and the caller charging source code 99 is used for the destination code charging of outgoing trunk group.

```
ADD CHGIDX: CHSC=0, RCHS=88, LOAD=ALL, CODEC=ALL, CHA=0;
ADD CHGIDX: CHSC=0, RCHS=99, LOAD=ALL, CODEC=ALL, CHA=0;
```

V. Configuring data for interconnection with IAD

//Add two IADs using MGCP, with equipment ID of the IAD in the local office as shenzhen-iad104-2.com and that in the mutual assistance office as zhuhai-iad104-2.com.

```
ADD MGW: EID="shenzhen-iad104-2.com", GWTP=IAD, MGWDESC="shenzhen-iad104-2",
MGCMODULENO=22,  PTYPE=MGCP,  LA="191.169.150.30",  RA1="211.169.150.21",
RP=2427,  LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1,  UCATT=NOFX-0&NOM-0,
MSTYPE=MASTER;ADD    MGW:    EID="zhuhai-iad104-2.com",    GWTP=IAD,
MGWDESC="zhuhai-iad104-20", MGCMODULENO=22, PTYPE=MGCP, LA="191.169.150.30",
RA1="221.169.150.31",  RP=2427,  LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1,
UCATT=NOFX-0&NOM-0, MSTYPE=SLAVE;
```

📕 **Note:**

- In the above commands, the parameter "local address" must be set to the IP address of the IFMI of the local office, while the parameter "remote address" should be set based on the actual situation.
- You must set the parameter "master/slave type" correctly.

//Add eight ESL subscribers. 6540001~6540004 are local subscribers, and 8780001~8780004 are subscribers in the mutual assistance office.

```
ADB    VSBR:    SD=K'6540001,    ED=K'6540004,    LP=0,    MN=22,    DID=ESL,
EID="shenzhen-iad104-2.com", STID=1, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADB    VSBR:    SD=K'8780001,    ED=K'8780004,    LP=10,    MN=22,    DID=ESL,
EID="zhuhai-iad104-2.com", STID=1, CODEC=PCMA, RCHS=87, CSC=10, NS=CLIP-1;
```

 Note:

- In the above commands, such parameters such as "local DN set", "call source code", "charging source code" and parameters related to subscriber attributes must be correctly.
- When configuring subscriber data, you must specify the "equipment ID" of the corresponding MGW for the subscriber, but this piece of MGW data has been marked with "master/slaver flag", so the corresponding subscriber data contain such flag automatically.

//Add intra-office call prefix for the local office, with local DN set as 0, call prefix as 654 and service attribute as intra-office.

```
ADD    CNACLD:    LP=0,    PFX=K'654,    CSA=LCO,    MINL=7,    MAXL=7,    CHSC=65535,
SDESCRIPTION="Office_654";
```

//Add intra-office call prefix for the mutual assistance office, with local DN set as 10, call prefix as 878 and service attribute as intra-office.

```
ADD    CNACLD:    LP=10,    PFX=K'878,    CSA=LCO,    MINL=7,    MAXL=7,    CHSC=65535,
SDESCRIPTION="Office_878";
```

VI. Configuring data for interconnection with AMG

//Add two AMGs using MGCP, with equipment ID of the AMG in the local office as shenzhen-amg5000-2.com and that in the mutual assistance office as zhuhai-amg5000-2.com.

```
ADD MGW: EID="shenzhen-amg5000-2.com", GWTP=AG, MGWDESC="shenzhen-amg5000-2",
MGCMODULENO=22,    PTYPE=MGCP,    LA="191.169.150.30",    RA1="211.169.150.51",
RP=2427,    LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,    HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1, MSTYPE=MASTER;
ADD MGW: EID="zhuhai-amg5000-2.com", GWTP=AG, MGWDESC="zhuhai-amg5000-2",
MGCMODULENO=22,    PTYPE=MGCP,    LA="191.169.150.30",    RA1="221.169.150.61",
RP=2427,    LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,    HAIRPIN=NS,
UCATT=NOFX-0&NOM-0&V3FX-1, MSTYPE=SLAVE;
```

//Add 64 ESL subscribers. 6540100~6540131 are local subscribers, and 8780100~8780131 are subscribers in the mutual assistance office.

```
ADB    VSBR:    SD=K'6540100,    ED=K'6540131,    LP=0,    MN=22,    DID=ESL,
EID="shenzhen-amg5000-2.com", STID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADB    VSBR:    SD=K'8780100,    ED=K'8780131,    LP=10,    MN=22,    DID=ESL,
EID="zhuhai-amg5000-2.com", STID=0, CODEC=PCMA, RCHS=87, CSC=10, NS=CLIP-1;
```

VII. Configuring data for interconnection with UMG

//Add two UMG8900s. Set the equipment ID of the UMG8900 in the local office to 211.169.150.89:2944, and that of the UMG8900 in the mutual assistance office to 221.169.150.99:2944.

```
ADD MGW: EID="211.169.150.89:2944", GWTP=UMGW, MGWDESC="Shenzhen-UMG8900-2",
MGCMODULENO=22,    LA="191.169.150.30",    RA1="211.169.150.89",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,  HAIRPIN=S,  CODETYPE=ASN,
MSTYPE=MASTER;ADD    MGW:    EID="221.169.150.99:2944",    GWTP=UMGW,
MGWDESC="zhuhai-UMG8900-2",    MGCMODULENO=22,    LA="191.169.150.30",
RA1="221.169.150.99",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1,  HAIRPIN=S,  CODETYPE=ASN,
MSTYPE=SLAVE;
```

//Add 64 ESL subscribers. 6540200~6540231 are local subscribers, and 8780200~8780231 are subscribers in the mutual assistance office.

```
ADB    VSBR:    SD=K'6540200,    ED=K'6540231,    LP=0,    MN=22,    DID=ESL,
EID="211.169.150.89:2944", STID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;
ADB    VSBR:    SD=K'8780200,    ED=K'8780231,    LP=10,    MN=22,    DID=ESL,
EID="221.169.150.99:2944", STID=0, CODEC=PCMA, RCHS=87, CSC=10, NS=CLIP-1;
```

//Add two SGs (built in UMG8900), with SG ID of the local office as 0 and that of the mutual assistance office as 128.

```
ADD ESG: SGID=0, SGNAME="IUA SG", EID="211.169.150.89:2944";
ADD ESG: SGID=128, SGNAME="IUA SG", EID="221.169.150.99:2944";
```


 Note:

According to the principle for configuring signaling data, the ID of the built-in SG of the local office must be different from that of the mutual assistance office.

//Add two IUA linksets. Set the linkset index of the local office to 0 and that of the mutual assistance office to 128.

```
ADD IUALKS: LSX=0, LSNAME="IUA LinkSet 0", TM=LOADSHARE, DT=BRA, MN=22,
SGID=0;
```

```
ADD IUALKS: LSX=128, LSNAME="IUA LinkSet 128", TM=LOADSHARE, DT=BRA, MN=22,
SGID=128;
```

 Note:

According to the principle for configuring signaling data, the IUA linkset index of the local office must be different from that of the mutual assistance office.

//Add four IUA links. Set the IUA links of the local office to link 0 of BSGI 136 and link 0 of BSGI 137, and set those of the mutual assistance office to link 8 of BSGI 136 and link 8 of BSGI 137.

```
ADD IUALNK: MN=136, LNKN=0, LSX=0, LOCPORT=9900, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.17", MSF=MASTER;
ADD IUALNK: MN=137, LNKN=0, LSX=0, LOCPORT=9901, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.17", MSF=MASTER;
ADD IUALNK: MN=136, LNKN=8, LSX=128, LOCPORT=9900, LOCIP1="191.169.150.30",
PEERIP1="221.169.150.27", MSF=SLAVER;
ADD IUALNK: MN=137, LNKN=8, LSX=128, LOCPORT=9901, LOCIP1="191.169.150.30",
PEERIP1="221.169.150.27", MSF=SLAVER;
```

 Note:

- According to the principle for configuring signaling data, the IUA link numbers of the local office must be different from those of the mutual assistance office.
- In the above commands, the parameter "local IP address" must be set to the IP address of the IFMI of the local office, while the parameter "peer IP address" should be set based on the actual situation. Here, the parameter is the IP address of UMG8900 in the SIGTRAN protocol.
- You must set the parameter "master/slaver flag" correctly.

//Add ISDN data with ISDN index as 1 and maximum B channel as 2.

```
ADD ISDNDAT: ISDNX=1, BCHN=2;
```

//Add 64 BRA subscribers. 6540300~6540331 are local subscribers, and 8780300~8780331 are subscribers in the mutual assistance office.

```
ADB BRA: SD=K'6540300, ED=K'6540331, LP=0, EID="211.169.150.89:2944", LKS=0,
SIID=10000, STID=32, CODEC=PCMA, RCHS=65, CSC=0, UTP=NRM, UT=NRM, AUT=NRM,
NS=CLIP-1, CGF=NO, ISDN=1, ISA=MSN-1, CHT=PRDC;
```

```
ADB  BRA:  SD=K'8780300,  ED=K'8780331,  LP=10,  EID="221.169.150.99:2944",
LKS=128, SIID=20000, STID=32, CODEC=PCMA, RCHS=87, CSC=10, UTP=NRM, UT=NRM,
AUT=NRM, NS=CLIP-1, CGF=NO, ISDN=1, ISA=MSN-1, CHT=PRDC;
```

📖 **Note:**

- In the above commands, such parameters such as "local DN set", "call source code", "charging source code" and parameters related to subscriber attributes must be correctly.
- When configuring subscriber data, you must specify the "equipment ID" of the corresponding MGW for the subscriber, but this MGW data has been marked with "master/slaver flag", so the corresponding subscriber data contains such flag automatically.

VIII. Configuring multi-media subscriber data

//Add two multi-media devices using SIP, with equipment ID of the device in the local office as 6540401 and that in the mutual assistance office as 8780401.

```
ADD MMTE: EID="6540401", MN=22, PT=SIP, IFMMN=132, PASS="112233", AT=ABE,
MSTYPE=MASTER;
ADD MMTE: EID="8780401", MN=22, PT=SIP, IFMMN=132, PASS="223344", AT=ABE,
MSTYPE=SLAVE;
```

//Add two SIP subscribers. 6540401 is a local SIP subscriber, and 8780401 is a SIP subscriber in the mutual assistance office.

```
ADD MSBR: D=K'6540401, LP=0, EID="6540401", RCHS=65, CSC=0, NS=CLIP-1;
ADD MSBR: D=K'8780401, LP=10, EID="8780401", RCHS=87, CSC=10, NS=CLIP-1;
```

IX. Configuring data for interconnection with PSTN

//Add two TMG8010s, with equipment ID of the TMG8010 in the local office as 211.169.150.81:2944 and that in the mutual assistance office as 221.169.150.91:2944. The module Number of the FCCU is 23.

```
ADD MGW: EID="211.169.150.81:2944", GWTP=TG, MGWDESC="Shenzhen-TMG8010-2",
MGCMODULENO=23,   LA="191.169.150.30",   RA1="191.169.150.81",   RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ABNF,
MSTYPE=MASTER;
ADD MGW: EID="221.169.150.91:2944", GWTP=TG, MGWDESC="Zhuhai-TMG8010-2",
MGCMODULENO=23,   LA="191.169.150.30",   RA1="221.169.150.91",   RP=2944,
```

```
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ABNF,
MSTYPE=SLAVE;
```

//Add two SGs (built in TMG8010), with SG ID of the local office as 1 and that of the mutual assistance office as 129.

```
ADD ESG: SGID=1, SGNAME="M2UA SG", EID="211.169.150.81:2944";
ADD ESG: SGID=129, SGNAME="M2UA SG", EID="221.169.150.91:2944";
```

 Note:

According to the principle for configuring signaling data, the ID of the built-in SG of the local office must be different from that of the mutual assistance office.

//Add four M2UA links. Set the M2UA links of the local office to link 0 of BSGI 136 and link 0 of BSGI 137, and set those of the mutual assistance office to link 8 of BSGI 136 and link 8 of BSGI 137.

```
ADD M2LNK: MN=136, LNKN=0, SGID=1, LOCPORT=2904, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.81", MSF=MASTER;
ADD M2LNK: MN=137, LNKN=0, SGID=1, LOCPORT=2910, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.81", MSF=MASTER;
ADD M2LNK: MN=136, LNKN=8, SGID=129, LOCPORT=2911, LOCIP1="191.169.150.30",
PEERIP1="221.169.150.91", MSF=SLAVER;
ADD M2LNK: MN=137, LNKN=8, SGID=129, LOCPORT=2912, LOCIP1="191.169.150.30",
PEERIP1="221.169.150.91", MSF=SLAVER;
```

 Note:

- According to the principle for configuring signaling data, the M2UA link numbers of the local office must be different from those of the mutual assistance office.
- In the above commands, the parameter "local IP address" must be set to the IP address of the IFMI of the local office, while the parameter "peer IP address" should be set based on the actual situation.
- You must set the parameter "master/slaver flag" correctly.

//Add two MTP DSPs, with DPC as 1100bb, OPC corresponding to DSP index 0 as 001122 (signaling point code of the local office), and OPC corresponding to DSP index 128 as 001133 (signaling point code of the mutual assistance office).

```
ADD N7DSP: DPX=0, DPC="1100bb", OPC="001122", DPNAME="A to PSTN", STPF=FALSE,
ADJF=TRUE;
```

```
ADD N7DSP: DPX=128, DPC="1100bb", OPC="001133", DPNAME="B to PSTN", STPF=FALSE,
ADJF=TRUE;
```

📖 **Note:**

According to the principle for configuring signaling data, the DSP indexes of the local office must be different from those of the mutual assistance office.

//Add two MTP linksets. Set linkset index to 0 and adjacent DSP index to 0 for the local office. Set linkset index to 128 and adjacent DSP index to 128 for the mutual assistance office.

```
ADD N7LKS: LSX=0, ASPX=0, LSNAME="A to PSTN";
ADD N7LKS: LSX=128, ASPX=128, LSNAME="B to PSTN";
```

📖 **Note:**

According to the principle for configuring signaling data, the MTP linkset indexes of the local office must be different from those of the mutual assistance office.

//Add four MTP links. Set the MTP links of the local office to link 0 of BSGI 136 and link 0 of BSGI 137, and set those of the mutual assistance office to link 8 of BSGI 136 and link 8 of BSGI 137.

```
ADD N7LNK: MN=136, LNKN=0, LNKNAME="A to PSTN", LNKTYPE=2, M2LNKNO=0,
BINIFID=101, LSX=0, SLC=0, SLCS=0, MSF=MASTER;
ADD N7LNK: MN=137, LNKN=0, LNKNAME="A to PSTN", LNKTYPE=2, M2LNKNO=0,
BINIFID=102, LSX=0, SLC=1, SLCS=1, MSF=MASTER;
ADD N7LNK: MN=136, LNKN=8, LNKNAME="B to PSTN", LNKTYPE=2, M2LNKNO=8,
BINIFID=103, LSX=128, SLC=0, SLCS=0, MSF=SLAVER;
ADD N7LNK: MN=137, LNKN=8, LNKNAME="B to PSTN", LNKTYPE=2, M2LNKNO=8,
BINIFID=104, LSX=128, SLC=1, SLCS=1, MSF=SLAVER;
```

 Note:

- According to the principle for configuring signaling data, the MTP link numbers of the local office must be different from those of the mutual assistance office.
- In the above example, the parameter "master/slaver flag" of the MTP links must be set to the same value as that of the corresponding M2UA links.

//Add MTP routes to the PSTN switch. For the MTP links from the local office to the PSTN switch, set the linkset index to 0 and the DSP index to 0; for the MTP links from the mutual assistance office to the PSTN switch, set the linkset index to 128 and the DSP index to 128.

```
ADD N7RT: LSX=0, DPX=0, RTNAME="A to PSTN";
ADD N7RT: LSX=128, DPX=128, RTNAME="B to PSTN";
```

//Add an office direction to the PSTN switch, with office direction number as 0 and DPC as 1100bb.

```
ADD OFC: O=0, ON="To PSTN", DOT=CMPX, DOL=LOW, DPC1="1100bb", METHOD=NOCONV;
```

 Note:

According to the principle for configuring routing data, you only need to add one office direction, for the PSTN switch is the destination for both the local office and the mutual assistance office.

//Add two sub-routes. Number the sub-route from the local office to the PSTN switch as 0 and that from the mutual assistance office to the PSTN switch as 128.

```
ADD SRT: SRC=0, O=0, SRN="A to PSTN", TSM=CYC;
ADD SRT: SRC=128, O=0, SRN="B to PSTN", TSM=CYC;
```

//Add two routes. Number the route from the local office to the PSTN switch as 0 and that from the mutual assistance office to the PSTN switch as 128.

```
ADD RT: R=0, RN="A to PSTN ", SRST=SEQ, SR1=0, SR2=128;
ADD RT: R=128, RN="B to PSTN ", SRST=SEQ, SR1=128, SR2=0;
```

 Note:

In the above commands, the direct and alternative sub-routes from the local office to the PSTN switch are numbered 0 and 128 respectively, and those from the mutual assistance office to the PSTN switch are numbered 128 and 0 respectively.

//Add route analysis data to the PSTN switch. For the routes from the local office to the PSTN switch, set the route selection code to 22 and the route number to 0; for the routes from the mutual assistance office to the PSTN switch, set the route selection code to 33 and the route number to 128.

```
ADD RTANA: RSC=22, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=0,
ISUP=NOCHG;
ADD RTANA: RSC=33, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=128,
ISUP=NOCHG;
```

//Add No. 7 trunk groups, with the trunk groups from the local office to the PSTN switch numbered 0 and 1, and the trunk groups from the mutual assistance office to the PSTN switch numbered 100 and 101.

```
ADD N7TG: TG=0, EID="211.169.150.81:2944", G=OUT, SRC=0, TGN="A to PSTN",
CSC=0, RCHS=88, OTCS=99;
ADD N7TG: TG=1, EID="211.169.150.81:2944", G=IN, SRC=0, TGN="A to PSTN", CSC=0,
RCHS=88, OTCS=99;
ADD N7TG: TG=100, EID="221.169.150.91:2944", G=OUT, SRC=128, TGN="B to PSTN",
CSC=10, RCHS=88, OTCS=99, CCT=DEC, CCV=32;
ADD N7TG: TG=101, EID="221.169.150.91:2944", G=IN, SRC=128, TGN="B to PSTN",
CSC=10, RCHS=88, OTCS=99, CCT=DEC, CCV=32;
```

 Note:

- According to the principle for configuring trunk data, the trunk group numbers of the local office must be different from those of the mutual assistance office.
- To enable No. 7 trunk groups to use the correct number analysis data table for incoming calls, you must set the parameter "call source code" in the command correctly. In the example, the call source codes of trunk groups 0 and 1 are set to 0, and those of trunk groups 100 and 101 are set to 10.
- In the example, if it is required to implement CIC conversion to trunk groups 100 and 101, set "CIC change type" to "decrease" and "CIC change value" to 32.

//Add No. 7 trunk circuits.

```
ADD N7TKC: MN=23, TG=0, SC=0, EC=31, SCIC=0, SCF=FALSE, TID=0;

ADD N7TKC: MN=23, TG=1, SC=32, EC=63, SCIC=32, SCF=FALSE, TID=32;

ADD N7TKC: MN=23, TG=100, SC=64, EC=95, SCIC=64, SCF=FALSE, TID=0;

ADD N7TKC: MN=23, TG=101, SC=96, EC=127, SCIC=96, SCF=FALSE, TID=32;
```

📖 **Note:**

- If the No. 7 trunk circuits of both the local office and the mutual assistance office are connected with the same FCCU/FCSU, the circuit number range and the CIC code of each trunk group must be set globally.
- For the circuit number range, you must set the parameter "start circuit termination ID" in the command **ADD N7TKC** correctly to ensure successful interworking between SoftX3000 and the PSTN switch.
- For the CIC code, you might need to change the CIC code of the corresponding No. 7 trunk group with the command **MOD N7TG** to ensure successful interworking between SoftX3000 and the PSTN switch.

//Add a toll prefix for toll calls from the local office to the PSTN switch. Set the local DN set to 0, prefix to 0, service attribute to national toll, and route selection code to 22.

```
ADD CNACLD: LP=0, PFX=K'0, CSA=NTT, RSC=22, MINL=3, MAXL=24, CHSC=0,
SDESCRIPTION="Toll call";
```

//Add a toll prefix for toll calls from the mutual assistance office to the PSTN switch. Set the local DN set to 10, prefix to 0, service attribute to national toll, and route selection code to 33.

```
ADD CNACLD: LP=10, PFX=K'0, CSA=NTT, RSC=33, MINL=3, MAXL=24, CHSC=0,
SDESCRIPTION="Toll call";
```

X. Configuring routing data for interworking between the local office and the mutual assistance office

//Add three office directions numbered 10, 11 and 12 respectively.

```
ADD OFC: O=10, ON="B_office", DOT=NATT, DOL=SAME, METHOD=NOCONV;

ADD OFC: O=11, ON="B_office", DOT=NATT, DOL=SAME, METHOD=NOCONV;

ADD OFC: O=12, ON="A_office", DOT=NATT, DOL=SAME, METHOD=NOCONV;
```

📖 **Note:**

According to the principle for configuring routing data, you must configure three office directions for the interworking between the local office and the mutual assistance office:

- The office direction numbered 10 is destined to the mutual assistance office before the dual homing switchover, that is, the mutual assistance office in normal conditions.
- The office direction numbered 11 is destined to the mutual assistance office after the dual homing switchover, that is, the virtual mutual assistance office in the local office.
- The office direction numbered 12 is destined to the local office.

//Add three sub-routes numbered 10, 11 and 12 respectively.

```
ADD SRT: SRC=10, O=10, SRN="A to B_0", TSM=CYC;
ADD SRT: SRC=11, O=11, SRN="A to B_1", TSM=CYC;
ADD SRT: SRC=12, O=12, SRN="B to A", TSM=CYC;
```

Note:

These three sub-routes correspond to the preceding three office directions:

- The sub-route numbered 10 is the sub-route from the local office to the mutual assistance office before the dual homing switchover.
- The sub-route numbered 11 is the sub-route from the local office to the virtual mutual assistance office after the dual homing switchover. You must set the SIP trunk group contained in this sub-route as the self-loop trunk group of the local office.
- The sub-route numbered 12 is the sub-route from the virtual mutual assistance office to the local office after the dual homing switchover. You must set the SIP trunk group contained in this sub-route as the self-loop trunk group of the local office.

//Add two routes numbered 10 and 12 respectively.

```
ADD RT: R=10, RN="To B_office", SRST=SEQ, SR1=10, SR2=11;
ADD RT: R=12, RN="To A_office", SRST=SEQ, SR1=12;
```

Note:

- Route 10 is the route from the local office to the mutual assistance office, and you must configure two sub-routes for it: sub-route 10 is the direct sub-route, and sub-route 11 is the alternative sub-route.
- Route 12 is the route from the virtual mutual assistance office to the local office, and you only need to configure one sub-route for it.

//Add route analysis data. For the route from the local office to the mutual assistance office, set the route selection code to 87 and the route number to 10; for the route from the virtual mutual assistance office to the local office, set the route selection code to 65 and the route number to 12.

```
ADD RTANA: RSC=87, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=10,
ISUP=SIP_M;
ADD RTANA: RSC=65, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=12,
ISUP=SIP_M;
```

//Add three SIP trunk groups.

```
ADD SIPTG: TG=10, CSC=0, SRT=10, TGN="A to B_0", RCHS=88, OTCS=99, IMN=132,
OSU="221.169.150.40:5060", OST=YES, UHB=YES;
ADD SIPTG: TG=11, CSC=0, SRT=11, TGN="A to B_1", RCHS=88, OTCS=99 , IMN=132,
OSU="191.169.150.31:5060", OST=YES, UHB=YES;
ADD SIPTG: TG=12, CSC=10, SRT=12, TGN="B to A", RCHS=88, OTCS=99 , IMN=133,
OSU="191.169.150.30:5060", OST=YES, UHB=YES;
```

 Note:

- To enable SoftX3000 to detect the working state of SIP trunks correctly, you must set the parameter "use heartbeat" in the command to "Yes"; otherwise, SoftX3000 cannot use the alternative sub-route.
- To enable SIP trunk groups to use the correct number analysis data table for incoming calls, you must set the parameter "call source code" in the command correctly. In the example, the call source codes of trunk groups 10 and 11 are set to 0, and that of trunk group 12 is set to 10.
- SIP trunk groups 11 and 12 must be configured as the self-loop trunk groups of the local office, so their source and destination IP addresses must be the IP addresses of the IFMIs in the local office and the addresses are crossly configured. As shown in the example, the source IP address of trunk group 11 is 191.169.150.30 (the module number of the IFMI is 132), and its destination IP address is 191.169.150.31. The source IP address of trunk group 12 is 191.169.150.31 (the module number of the IFMI is 133), and its destination IP address is 191.169.150.30.

//Add outgoing prefix for the calls from the local office to the mutual assistance office. Set the local DN set to 0, prefix to 878, service attribute to local, and route selection code to 87.

```
ADD CNACLD: LP=0, PFX=K'878, CSA=LC, RSC=87, MINL=7, MAXL=7, CHSC=65535,
SDESCRIPTION="Office_878";
```

 Note:

It is known from the routing data configured previously that, before the dual homing switchover, when a local subscriber dials the prefix 878, the system will select the normal sub-route from the local office to the mutual assistance office; after the dual homing switchover, when a local subscriber dials the prefix 878, the system will select the sub-route from the local office to the virtual mutual assistance office (that is, the self-loop sub-route of the local office). Therefore, the call attribute and charging attribute of the local prefix 878 remain unchanged before and after the dual homing switchover.

//Add outgoing prefix for the calls from the mutual assistance office to the local office. Set the local DN set to 10, prefix to 654, service attribute to local, and route selection code to 65.

```
ADD CNACLD: LP=10, PFX=K'654, CSA=LC, RSC=65, MINL=7, MAXL=7, CHSC=65535,
SDESCRIPTION="Office_654";
```

 Note:

After the dual homing switchover, when a subscriber in the mutual assistance office dials the prefix 654, the system will select the sub-route from the virtual mutual assistance office to the local office (that is, the self-loop sub-route of the local office). Therefore, the call attribute and charging attribute of the prefix 654 in the virtual mutual assistance office and the mutual assistance office remain unchanged before and after the dual homing switchover.

6.1.3 Commissioning Guideline

After completing the above configurations, verify the services following the steps below.

I. Checking whether the network connection is normal

Execute the Ping command on the U-SYS SoftX3000 Client to check whether the network connection between the SoftX3000 in the local office and that in the mutual assistance office is normal. If the connection is normal, proceed with the subsequent steps. If the connection is abnormal, check whether network cables are well connected and whether the IP route data is configured correctly. After removing the trouble, proceed with the subsequent steps.

II. Checking whether dual homing heartbeat links are normal

Execute the command **DSP DHSTA** on the U-SYS SoftX3000 Client to check whether the two dual homing heartbeat links are normal. If one of the links is abnormal, use the command **LST DHHCFG** to check whether such parameter as peer IP address, local UDP port number, peer UDP port number and secret key are configured correctly.

III. Checking services in mutual assistance inactive state

1) Execute the command **SET DHWM: WM=ASSIST, SM=MANUAL, FS=DEACTIVE;** on the U-SYS SoftX3000 Client in the local office to force SoftX3000 to work in the mutual assistance inactive state.
2) Execute the command **DSP MGW** to query the state of MGWs. All MGWs that are primarily controlled by the SoftX3000 in the local office should be displayed as normal, but those that are secondarily controlled by the SoftX3000 in the local office should be displayed as abnormal.
3) Use the command **DSP IUALNK**, **DSP M2LNK** or **DSP N7LNK** to query the state of each signaling link. The links that are primarily controlled by the SoftX3000 in the local office should be displayed as normal, while those that are secondarily controlled by the SoftX3000 in the local office should be displayed as abnormal.
4) Originate various outgoing and incoming calls such as intra-office calls, inter-office calls, and national toll calls, trace the connections, and observe the bills to check whether the calls can be connected and charged successfully.

IV. Checking services in mutual assistance active state

1) Execute the command **SET DHWM: WM=ASSIST, SM=AUTO, TM=MODE1-1&MODE2-0;** on the U-SYS SoftX3000 Client to set the dual homing switchover mode of the local SoftX3000 to automatic switchover.
2) Execute the command **SET DHWM: WM=ASSIST, SM=MANUAL, FS=DEACTIVE;** on the U-SYS SoftX3000 Client in the mutual assistance office to force SoftX3000 to work in the mutual assistance inactive state.
3) Use the command **DSP MGW** to query the state of MGWs. All MGWs that are primarily and secondarily controlled by the SoftX3000 in the local office should be displayed as normal.
4) Use the command **DSP IUALNK**, **DSP M2LNK** or **DSP N7LNK** to query the state of each signaling link. All links that are primarily and secondarily controlled by the SoftX3000 in the local office should be displayed as normal.
5) Originate various outgoing and incoming calls such as intra-office calls, inter-office calls, and national toll calls. Trace these connections. Finally observe the bills to check whether the calls can be connected and charged successfully.
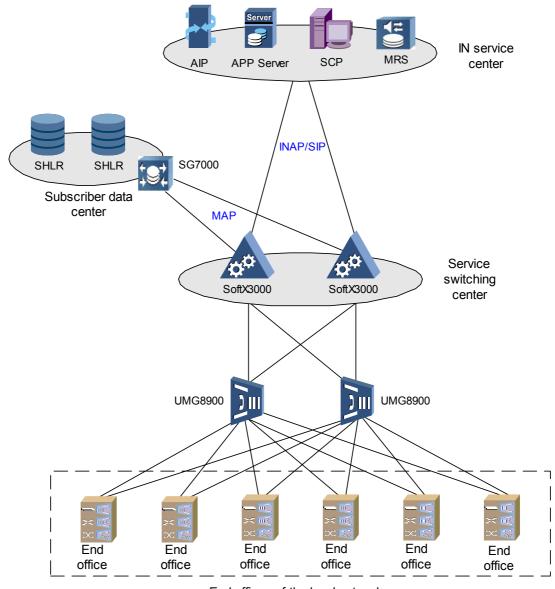
After the test, execute the command **SET DHWM: WM=ASSIST, SM=AUTO, TM=MODE1-1&MODE2-0;** on the U-SYS SoftX3000 Client in the mutual assistance office to set the dual homing switchover mode of SoftX3000 to automatic switchover.

6.2 Configuring Smart Network Data

6.2.1 Introduction

I. Requirements

Smart network is a full solution used to reconstruct the present PSTN by separating service from call control. Most end offices in PSTN do not support the SSP function. Therefore, in the construction of smart network, three centers are established to shield end offices and enable value-added services rapidly. The three centers are: service switching center, subscriber data center, and IN service center. The typical networking model is as shown in Figure 6-2.

Figure 6-2 Networking for smart network solution

It is required to meet the following requirements by configuring data at SoftX3000 side.

1) The signaling between the SoftX3000 and SCP adopts the "M3UA–M3UA" mode. The SoftX3000 and SCP together can provide services such as color dial tone, ring back tone, and intelligent card number.

2) The signaling between the SoftX3000 and SHLR (through SG7000) adopts the "M3UA–M3UA" mode. The SoftX3000 and SHLR together can provide services such as NP, CUG, MON, caller and callee IN subscription.

II. Planning basic data

Before configuring data at the SoftX3000 side, make sure that the following service interconnection parameters have been negotiated between the SoftX3000 and the SCP and SHLR, as shown in Table 6-2 and Table 6-3.

Table 6-2 Parameters for interconnection between SoftX3000 and SCP

Serial No.	Parameter	Value
1	IP address of the IFMI of the SoftX3000	191.169.150.30/255.255.0.0
2	IP address of the SCP	191.169.150.12/255.255.0.0
3	Signaling point code of the SoftX3000	001122 (national network)
4	Signaling point code of the SCP	115566 (national network)
5	Local SCTP port number of the M3UA link at the SoftX3000 (client) side	M3UA link 2: 2905 M3UA link 3: 2911
6	Local SCTP port number of the M3UA link at the SCP (server) side	2905
7	Number of subsystem between the SoftX3000 and the SCP	SCMG and INAP
8	DP number of the color dial tone service	1
9	Service key of the color dial tone service	801
10	DP number of the ring back tone service	12
11	Service key of the ring back tone service	812
12	Access code of the ACC service	201
13	DP number of the ACC service	3
14	Service key of the ACC service	201

Table 6-3 Parameters for interconnection between SoftX3000 and SHLR

Serial No.	Parameter	Value
1	IP address of the IFMI of the SoftX3000	191.169.150.30/255.255.0.0
2	IP address of the SG7000	191.169.150.13/255.255.0.0
3	Signaling point code of the SoftX3000	001122 (national network)
4	Signaling point code of the SG7000	115577 (national network)

Serial No.	Parameter	Value
5	Signaling point code of the active SHLR	115588 (national network)
6	Signaling point code of the standby SHLR	115599 (national network)
7	Local SCTP port number of the M3UA link at the SoftX3000 (client) side	M3UA link 2: 2905 M3UA link 3: 2911
8	Local SCTP port number of the M3UA link at the SG7000 (server) side	2905
9	Number of subsystem between the SoftX3000 and the SG7000	MSC and MAP
10	Service indicator of the CUG service	111
11	Triggering indicator of the MON service	222
12	Release indicator of the MON service	333

6.2.2 Script

I. Configuring M3UA data

//Add an M3UA local entity. Set local entity index to 0, local entity point code to 001122, and routing context to 333777.

```
ADD M3LE: LEX=0, LENAME="SoftX3000", OPC="001122", LET=AS, RC=333777;
```

 Note:

Routing context can be a decimal numeral, or it may not be specified. You must set its value accordingly after negotiating with the SCP side during the actual interconnection process.

//Add four M3UA destination entities. Destination entity index 50 represents the SCP, destination entity index 51 represents the SG7000 directly connected to the SoftX3000, destination entity index 52 represents the active SHLR, and destination entity index 53 represents the standby SHLR.

```
ADD M3DE: DEX=50, DENAME="SCP", DPC="115566", STPF=FALSE, DET=AS;
ADD M3DE: DEX=51, DENAME="SG", DPC="115577", STPF=TRUE, DET=SG, ADJF=YES;
ADD M3DE: DEX=52, DENAME="M_SHLR", DPC="115588", STPF=FALSE, DET=SP;
```

```
ADD M3DE: DEX=53, DENAME="S_SHLR", DPC="115599", STPF=FALSE, DET=SP;
```

📕 **Note:**

- You must set destination entity type of the SCP to application server because symmetric networking mode is used between the SCP and SoftX3000, and the destination entity type of the SoftX3000 is application server.
- You must set destination entity type of the SG7000 to signaling gateway because asymmetric networking mode is used between the SoftX3000 and SG7000, and the destination entity type of the SoftX3000 is application server.
- You must set destination entity type of the SHLR to signaling point because the SHLR needs to interwork with the SoftX3000 through MAP with the help of the SG7000.

//Add two M3UA linksets. For one linkset, set linkset index to 1 and adjacent entity index to 50. For the other linkset, set linkset index to 2 and adjacent entity index to 51.

```
ADD M3LKS: LSX=1, LSNAME="To SCP", ADX=50, TM=LOADSHARE, WM=IPSP;
ADD M3LKS: LSX=2, LSNAME="To SG", ADX=51, TM=LOADSHARE, WM=ASP;
```

📕 **Note:**

- You must set work mode to IPSP because symmetric networking mode is used between the SCP and SoftX3000, and the destination entity type of the SoftX3000 is application server.
- You must set work mode to ASP because asymmetric networking mode is used between the SG7000 and SoftX3000, and the destination entity type of the SoftX3000 is application server.
- Traffic mode of the linkset must be consistent with that at the signaling gateway side. Otherwise, no M3UA link in the linkset can work. Normally, set traffic mode of the linkset to load-sharing mode.

//Add four M3UA links. The first two links are between the SoftX3000 and SCP. They belong to M3UA linkset 1. The other two links are between the SoftX3000 and SG7000. They belong to M3UA linkset 2.

```
ADD M3LNK: MN=136, LNKN=1, LNKNAME="To SCP #0", LOCIP1="191.169.150.30",
LOCPORT=2905, PEERIP1="191.169.150.12", PEERPORT=2905, CS=C, LSX=1;
ADD M3LNK: MN=137, LNKN=1, LNKNAME="To SCP #1", LOCIP1="191.169.150.30",
LOCPORT=2911, PEERIP1="191.169.150.12", PEERPORT=2905, CS=C, LSX=1;
ADD M3LNK: MN=136, LNKN=2, LNKNAME="To SG #0", LOCIP1="191.169.150.30",
LOCPORT=2905, PEERIP1="191.169.150.13", PEERPORT=2905, CS=C, LSX=2;
```

```
ADD M3LNK: MN=137, LNKN=2, LNKNAME="To SG #1", LOCIP1="191.169.150.30",
LOCPORT=2911, PEERIP1="191.169.150.13", PEERPORT=2905, CS=C, LSX=2;
```

📖 **Note:**

If the SoftX3000 has two BSGIs, configure two M3UA links to different BSGI to ensure the reliability of the M3UA links.

//Add an M3UA route to SCP. Set destination entity index to 50 and linkset index to 1.

```
ADD M3RT: RTNAME="To SCP", DEX=50, LSX=1;
```

//Add two M3UA routes to SHLR. Set destination entity indices to 52 and 53 respectively. Set both linkset indices to 2.

```
ADD M3RT: RTNAME="To M_SHLR", DEX=52, LSX=2;
ADD M3RT: RTNAME="To S_SHLR", DEX=53, LSX=2;
```

II. Configuring data for interconnecting SHLR

//Add two SCCP destination signaling points. For one point, set DSP index to 52 and DPC to 115588. For the other point, set DSP index to 53 and DPC to 115599.

```
ADD SCCPDSP: DPX=52, NI=NN, DPC="115588", DPNAME="M_SHLR", SHAREFLAG=NONE;
ADD SCCPDSP: DPX=53, NI=NN, DPC="115599", DPNAME="S_SHLR", SHAREFLAG=NONE;
```

//Add two SHLR local addresses. For one address, set SHLR address index to 0, which represents the active SHLR. Set SSN to MSC 0x08. For the other address, set SHLR address index to 1, which represents the standby SHLR. Set SSN to MSC 0x08.

```
ADD   SHLRLA:   SHLRADDRINDEX=0,   SHLRDESC="M_SHLR",   SSNF=YES,   RT=DPC,
DPC="001122", NI=NN, SSN=MSC;
ADD   SHLRLA:   SHLRADDRINDEX=1,   SHLRDESC="S_SHLR",   SSNF=YES,   RT=DPC,
DPC="001122", NI=NN, SSN=MSC;
```

📖 **Note:**

- For adding SHLR local addresses, set SSN to MSC 0x08 normally.
- The DPC in the command is the signaling point code of the local office. It must be defined in the command **SET OFI** and configured in the command **ADD SCCPDSP** (OPC needs to be configured) before being referenced here.

//Add two SHLR remote addresses. For one address, set SHLR address index to 0, which represents the active SHLR. Set SSN to HLR 0x06. For the other address, set SHLR address index to 1, which represents the standby SHLR. Set SSN to HLR 0x06.

```
ADD SHLRRA: SHLRADDRINDEX=0, SSNF=YES, RT=DPC, DPC="115588", NI=NN, SSN=HLR;
ADD SHLRRA: SHLRADDRINDEX=1, SSNF=YES, RT=DPC, DPC="115599", NI=NN, SSN=HLR;
```

📖 Note:

- For adding SHLR remote addresses, set SSN to HLR 0x06 normally.
- The DPC in the command is the signaling point code of the SHLR. It must be defined in the command **ADD M3DE** and configured in the command **ADD SCCPDSP** (DPC needs to be configured) before being referenced here.

//Add an SHLR group. Set SHLR group number to 0, select mode to active/standby mode, SHLR index 1 to 0, and SHLR index 2 to 1.

```
ADD SHLRGRP: SHLRGRPNUMBER=0, SELECTMODE=STB, SHLRIDX1=0, SHLRIDX2=1;
```

//Add SHLR configuration. Set "Query SHLR type" to "Standard".

```
ADD SHLRCFG: SHLRSLC=0, SHLRSSC=0, QTYPE=STD, OVRPFLG=NO, SHLRGRPNO=0;
```

III. Configuring SCCP signaling data interconnecting SCP

//Add an SCCP destination signaling point. Set DSP index to 50 and DPC to 115566.

```
ADD SCCPDSP: DPX=50, NI=NN, DPC="115566", DPNAME="SCP", SHAREFLAG=NONE;
```

//Add SCCP sub-system numbers.

```
ADD  SCCPSSN:  SSNX=0,  NI=NN,  SSN=SCMG,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=1,  NI=NN,  SSN=INAP,  SPC="001122",  OPC="001122",
SSNNAME="SSP to SSP";
ADD  SCCPSSN:  SSNX=6,  NI=NN,  SSN=SCMG,  SPC="115566",  OPC="001122",
SSNNAME="SSP to SCP";
ADD  SCCPSSN:  SSNX=7,  NI=NN,  SSN=INAP,  SPC="115566",  OPC="001122",
SSNNAME="SSP to SCP";
```

 Note:

- Configure two SSNs, SCMG 0x01 and INAP 0x0C, for fixed IN services.
- The SPC parameter in the command is the destination signaling point (receiver of the local SCCP message) code of the subsystem. You must configure two destination signaling points for each subsystem: SCCP remote signaling point and local signaling point.

IV. Configuring IN service data interconnecting SCP

//Add called number analysis. Set call prefix to 201.

```
ADD  CNACLD:  PFX=K'201,  CSTP=IN,  CSA=INSVR,  MINL=3,  MAXL=3,  CHSC=0,
SDESCRIPTION="ACC Service";
```

 Note:

- Set service category of the call prefix to intelligent service if description is set to ACC service.
- Configure intelligent call prefix and access code only when the number of DP is 3.

//Add access code description. Set Access code to 201.

```
ADD ACCODE: CODE=K'201, POS=255, DBLEN=255;
```

 Note:

Set both database start position and database field length to 255 because there is no need to extract database number from the called number in the ACC service.

//Add TDP configuration. Set access code to 201 and call source code to 0.

```
ADD TDPCFG: DPNO=DP3, DPCNO=ACODE, CODE=K'201, SKEY=201, CALLSRC=0;
```

 Note:

For IN services of card number type, set DP number to 3 indicating to use "analysis information" call model at the SSP side.

//Add TDP configuration. Set DP number to DP1, service key to 801, and call source code to 0.

```
ADD TDPCFG: DPNO=DP1, SKEY=801, CALLSRC=0;
```

📖 **Note:**

For color dial tone service, set DP number to 1 indicating to use "sender_test call authentication" call model at the SSP side.

//Add TDP configuration. Set DP number to DP12, service key to 812, and call source code to 0.

```
ADD TDPCFG: DPNO=DP12, SKEY=812, CALLSRC=0;
```

📖 **Note:**

For ring back tone service, set DP number to 12 indicating to use "terminal_test call authentication" call model at the SSP side.

//Set DP Trigger Configuration. Set detect point 1 to true and detect point 12 to true.

```
SET DPTCFG: DP1=YES, DP12=YES;
```

//Add SCP physical address description. Set SCP number to 1, DPC to 115566, and SCP connect type to connect SAU.

```
ADD SCPADDR: SCP=1, DPC="115566", SCT=SAU;
```

//Add SSP physical address description. Set SCP number to 1 and DPC (of the SSP, SoftX3000) to 001122.

```
ADD SSPADDR: SCP=1, DPC="001122";
```

//Add SCP configuration. INAP messages of the ACC service (with service key as 201), color dial tone service (with service key as 801), and ring back tone service (with service key as 812) are processed by SCP1.

```
ADD SCPCFG: SKEY=201, DB=65535, SCP0=NO, SCP1=YES, SNAME=ACC;
ADD SCPCFG: SKEY=801, DB=65535, SCP0=NO, SCP1=YES, SNAME=ACC;
ADD SCPCFG: SKEY=812, DB=65535, SCP0=NO, SCP1=YES, SNAME=ACC;
```

📖 **Note:**

Database numbers in above commands are all set to 65535 because there is no need to extract database number from the called number in the above IN services

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6.2.3 Commissioning Guideline

Commission the functions and services according to related contents in chapter 2, "Trunk Signaling Networking" and chapter 4, "Service Related Configurations" in this manual.

6.3 Configuring Multi-OPC Data

6.3.1 Introduction

As restricted by the digits (12 digits) of SS7 signaling Circuit Identifier Code (CIC), when two offices adopt the single Originating Point Code (OPC) mode, at most 4096 No. 7 trunk circuits can be deployed between them, which cannot satisfy the demands for large quantity of trunks like in the networking of gateway office. To break the restriction, SoftX3000 provides the multi-OPC function, through which you can configure up to 256 OPCs for SoftX3000. Even if the peer office adopts single OPC mode, 65536 No. 7 trunk circuits can be deployed between them to meet the demands for large quantity of trunks like in the networking of gateway office.

I. Requirements

For example, SoftX3000 acts as the gateway office of operator A. Through the UMG8900, 6000 SS7 trunk circuits (200 E1s) are deployed between the SoftX3000 and the PSTN switch of operator B. The networking is as shown in Figure 6-3.
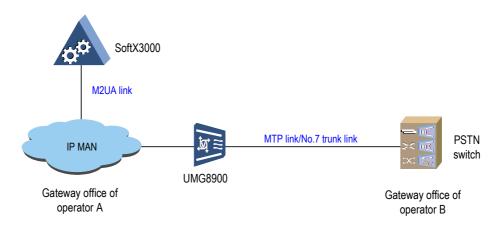
Figure 6-3 Networking in which SoftX3000 acts as gateway office

It is required to meet the following requirements by configuring data at SoftX3000 side.

1) SoftX3000 uses two OPC, of which each deploys 3000 SS7 trunk circuits (100 E1s).

2) Two M2UA links are provided between SoftX3000 and the UMG8010. Through the UMG8010, four 64 kbit/s MTP links are provided to the PSTN switch. Each M2UA link carries the SS7 signaling traffic on two MTP link.

II. Planning basic data

Only basic data necessary for the configuration is described for simplification purposes. See Table 6-4.

Table 6-4 Planning basic data

Serial No.	Parameter	Value
1	Signaling point code of SoftX3000	001122, 001123
2	Signaling point code of PSTN switch	110088
3	MTP link code	Link 0:0 Link 1:1 Link 2: 2 Link 3: 3
4	Type of signaling used for No. 7 trunk	ISUP
5	Circuit identification code for No. 7 trunk circuits	For each pair of OPC and DPC, the CIC ranges 0~3199.
6	Selection type for No. 7 trunk circuits	Circuits are selected in a cyclic manner. The local office controls those with an odd number, and the opposite controls those with an even number.

6.3.2 Script

I. Configuring local office data

//Set local office information. The signaling point code (OPC index is 0) of the local office is 001122 (national network).

```
SET OFI: OFN="SoftX3000", LOT=CMPX, NN=YES, SN1=NAT, SN2=NAT, SN3=NAT, SN4=NAT,
NPC="001122", NNS=SP24, SPF=YES;
```

//Add the signaling point code (OPC index is 1) 001133(national network).

```
ADD OFI: IDX=1, NATC="001133";
Modifying local office information to make the two original signaling point
codes as mutual nodes with each other.
MOD OFI: ID=0, PA1=NN, PAC1="001133";
MOD OFT: ID=1, PA1=NN, PAC1="001122";
```

 Note:

- In the above command, the signaling network where the mutual aid nodes are located must be consistent with that where the aided nodes are located. Otherwise, the data are invalid.
- In the above command, the mutual direction is unidirectional. So, if you want to set both original signaling point codes as mutual nodes, use command **MOD OFI** to configure the two data.
- If the local office starts multi-signaling point mutual function, the opposite must do corresponding adaptation when configuring its signaling route data to local office. Suppose the original signaling point A and B of local office are mutual nodes, the opposite must set its destination signaling point A and B as of STP attribute. And two more alternative signaling routes must be added. One is from A to B, while the other is from B to A.

II. Configuring MG data

//Add a UMG8900 with an equipment ID 211.169.150.95:2944.

```
ADD MGW: EID="211.169.150.95:2944", GWTP=UMGW, MGWDESC="ShenZhen-UMG8900-08",
MGCMODULENO=22,    LA="191.169.150.30",    RA1="211.169.150.95",    RP=2944,
LISTOFCODEC=PCMA-1&PCMU-1&G7231-1&G729A-1&T38-1, HAIRPIN=S, CODETYPE=ASN;
```

 Note:

- For UMG8900, whatever it serves as, AG or TG, the format of the parameter "Equipment ID" in this command must be "IP address: Port number", and "Gateway type" must be "UMGW".
- The "remote address" parameter in the command must be set to the IP address of the UMG8900 used for the H.248 protocol, that is, 211.169.150.95.
- Because the H.248 protocol of UMG8900 only support binary mode, the "code type" parameter in the command must be set to "ASN.1".
- Because UMG8900 supports the hairpin connection function, the "hairpin connection" parameter in the command must be set to "supported".

III. Configuring M2UA data

//Add an embedded signaling gateway (built in the UMG8900) with the ID 9.

ADD ESG: SGID=9, SGNAME="M2UA SG", EID="211.169.150.95:2944";

 Note:

Because the signaling gateway is embedded in the UMG8900, what is typed in the "equipment ID" parameter in the command must be the equipment ID of the UMG8900. Here it is set to "211.169.150.95:2944".

//Add two M2UA links, with the SoftX3000 serves as Client and the UMG8900 serves as Server.

```
ADD M2LNK: MN=136, LNKN=2, SGID=9, LOCPORT=2920, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.15";
ADD M2LNK: MN=136, LNKN=3, SGID=9, LOCPORT=2921, LOCIP1="191.169.150.30",
PEERIP1="211.169.150.15";
```

 Note:

The "peer IP address" parameter in the command must be set to the IP address of the UMG8900 used for the SIGTRAN protocol, that is, 211.169.150.15.

IV. Configuring MTP data

//Add the MTP Destination Point Code (DPC) 110088.

```
ADD  N7DSP:  DPX=80,  DPC="110088",  OPC="001122",  DPNAME="P_office  #0",
STPF=FALSE;
ADD  N7DSP:  DPX=81,  DPC="110088",  OPC="001133",  DPNAME="P_office  #1",
STPF=FALSE;
```

 Note:

Since the local office uses two OPCs, you should define corresponding MTP DPCs for different OPCs.

//Add two MTP link sets, with the indexes as 2 and 3.

```
ADD N7LKS: LSX=2, ASPX=80, LSNAME="To P_office #0";
ADD N7LKS: LSX=3, ASPX=81, LSNAME="To P_office #1";
```

 Note:

- Since the local office uses two OPCs, you should define corresponding MTP link sets for different OPCs.
- Because SoftX3000 and the PSTN switch are interconnected in the associated signaling mode of SS7, the "adjacent DSP index" parameter in the command must be set as the signaling point indexes of the PSTN switch. Here it is set to 80 and 81.

//Add four MTP links. The SS7 signaling traffic on the first two MTP links are carried by No. 2 M2UA link, and that on the last two MTP links are carried by No. 3 M2UA link.

```
ADD N7LNK: MN=136, LNKN=2, LNKNAME="To P_office #0", LNKTYPE=2, M2LNKNO=2,
BINIFID=21234, LSX=2, SLC=0, SLCS=0;
ADD N7LNK: MN=136, LNKN=3, LNKNAME="To P_office #1", LNKTYPE=2, M2LNKNO=2,
BINIFID=31234, LSX=2, SLC=1, SLCS=1;
ADD N7LNK: MN=136, LNKN=4, LNKNAME="To P_office #2", LNKTYPE=2, M2LNKNO=3,
BINIFID=41234, LSX=2, SLC=2, SLCS=2;
ADD N7LNK: MN=136, LNKN=5, LNKNAME="To P_office #3", LNKTYPE=2, M2LNKNO=3,
BINIFID=51234, LSX=2, SLC=3, SLCS=3;
```

 Note:

- Because SoftX3000 uses M2UA to carry SS7 signaling traffic on MTP links, the "link type" parameter in the command must be set to "M2UA 64K LINK".
- The "module number" parameter in the command can only be set to the module number of the corresponding BSGI. Here it is set to 136.
- For an MTP link with M2UA to carry SS7 signaling traffic (logical link at SoftX3000 side), its interface ID must be defined. Different MTP links have different (integer) interface IDs.

//Add the MTP route to the PSTN switch.

```
ADD N7RT: LSX=2, DPX=80, RTNAME="To P_office #0";
ADD N7RT: LSX=3, DPX=81, RTNAME="To P_office #1";
```

 Note:

Since there are two MTP link sets between the local office and the PSTN switch, two MTP routes must be configured from the local office to the PSTN switch.

V. Configuring routing data

//Add an office direction numbered 88 to the PSTN switch. The DPC is 110088.

```
ADD  OFC:  O=88,  ON="P_office",  DOT=CMPX,  DOL=SAME,  DPC1="110088",
METHOD=NOCONV;
```

 Note:

Because this office direction has No. 7 trunk circuits, the "DPC" parameter in the command must be set. Otherwise, errors will be encountered when you add a No. 7 trunk group by using the **ADD N7TG** command.

//Add two sub-routes numbered 80 and 81.

```
ADD SRT: SRC=80, O=88, SRN="To P_office #0", TSM=CYC;
ADD SRT: SRC=81, O=88, SRN="To P_office #1", TSM=CYC;
```

📖 **Note:**

Since the local office adopts two OPCs, it is recommended to configure two sub-routes between the local office and the PSTN switch, so as to promote the flexibility in route selection.

//Add a route numbered 88.

```
ADD RT: R=88, RN="To P_office", SRST=PERC, SR1=80, SR2=81, PSR1=50, PSR2=50;
```

📖 **Note:**

Since there are two sub-routes between the local office and the PSTN switch, the route selection policy is in "percentage selection" mode. The percentages of sub-route 80 and sub-route 81 are all 50%.

//Add route analysis data for the route to the PSTN switch. The route selection code is 88.

```
ADD RTANA: RSC=88, RSSC=0, RUT=ALL, ADI=ALL, CLR=ALL, TP=ALL, TMX=0, R=88,
ISUP=NOCHG;
```

VI. Configuring No. 7 trunk data

//Add No. 7 trunk groups. Trunk groups 80 and 82 belong to sub-route 80, and trunk groups 81 and 83 belong to sub-route 81.

```
ADD N7TG: TG=80, EID="211.169.150.95:2944", G=OUT, SRC=80, SOPC="001122",
SDPC="110088", TGN="To P_office";
ADD N7TG: TG=82, EID="211.169.150.95:2944", G=IN, SRC=80, SOPC="001122",
SDPC="110088", TGN="To P_office";
ADD N7TG: TG=81, EID="211.169.150.95:2944", G=OUT, SRC=81, SOPC="001133",
SDPC="110088", TGN="To P_office";
ADD N7TG: TG=83, EID="211.169.150.95:2944", G=IN, SRC=81, SOPC="001133",
SDPC="110088", TGN="To P_office";
```

📖 **Note:**

For trunk groups 80 and 82 that belong to sub-route 80, the used OPC and DPC are 001122 and 110088. For trunk groups 81 and 83 that belong to sub-route 81, the used OPC and DPC are 001133 and 110088.

//Add No. 7 trunk circuits, with the trunk group number as 80 (OPC is 001122, and DPC is 110088), circuit number ranges 1024~2623, and CIC ranges 0~1599.

```
ADD N7TKC: MN=23, TG=80, SC=1024, EC=1343, SCIC=0, SCF=FALSE, TID=0;
ADD N7TKC: MN=23, TG=80, SC=1344, EC=1663, SCIC=320, SCF=FALSE, TID=320;
ADD N7TKC: MN=23, TG=80, SC=1664, EC=1983, SCIC=640, SCF=FALSE, TID=640;
ADD N7TKC: MN=23, TG=80, SC=1984, EC=2303, SCIC=960, SCF=FALSE, TID=960;
ADD N7TKC: MN=23, TG=80, SC=2304, EC=2623, SCIC=1280, SCF=FALSE, TID=1280;
```

📖 Note:

- What are typed in the "start circuit" and "end circuit" parameters in the command are logical numbers universally assigned among No. 7, PRA, and R2 trunk circuits inside SoftX3000. The corresponding physical number at the TMG8010 side is specified in the "start circuit termination ID" parameter.
- The start circuit number must be a multiple of 32, such as 0, 32, 64, 96, and so on. Moreover, "end circuit number – start circuit number + 1" must be a multiple of 32 too.
- No more than 320 circuits can be added at one time.
- At the TMG8010 side, since each E1 has 32 timeslots, the termination ID of No. 0 timeslot is always a multiple of 32. When configuring data at the SoftX3000 side, to avoid errors, the parameter "start media gateway termination ID" must be a multiple of 32.

//Add No. 7 trunk circuits, with the trunk group number as 82 (OPC is 001122, and DPC is 110088), circuit number ranges 2624~4223, and CIC ranges 1600~3199.

```
ADD N7TKC: MN=23, TG=82, SC=2624, EC=2943, SCIC=1600, SCF=FALSE, TID=1600;
ADD N7TKC: MN=23, TG=82, SC=2944, EC=3263, SCIC=1920, SCF=FALSE, TID=1920;
ADD N7TKC: MN=23, TG=82, SC=3264, EC=3583, SCIC=2240, SCF=FALSE, TID=2240;
ADD N7TKC: MN=23, TG=82, SC=3584, EC=3903, SCIC=2560, SCF=FALSE, TID=2560;
ADD N7TKC: MN=23, TG=82, SC=3904, EC=4223, SCIC=2880, SCF=FALSE, TID=2880;
```

//Add No. 7 trunk circuits, with the trunk group number as 81 (OPC is 001133, and DPC is 110088), circuit number ranges 4224~5823, and CIC ranges 0~1599.

```
ADD N7TKC: MN=23, TG=81, SC=4224, EC=4543, SCIC=0, SCF=FALSE, TID=3200;
ADD N7TKC: MN=23, TG=81, SC=4544, EC=4863, SCIC=320, SCF=FALSE, TID=3520;
ADD N7TKC: MN=23, TG=81, SC=4864, EC=5183, SCIC=640, SCF=FALSE, TID=3840;
ADD N7TKC: MN=23, TG=81, SC=5184, EC=5503, SCIC=960, SCF=FALSE, TID=4160;
ADD N7TKC: MN=23, TG=81, SC=5504, EC=5823, SCIC=1280, SCF=FALSE, TID=4480;
```

//Add No. 7 trunk circuits, with the trunk group number as 83 (OPC is 001133, and DPC is 110088), circuit number ranges 5824~7423, and CIC ranges 1600~3199.

```
ADD N7TKC: MN=23, TG=83, SC=5824, EC=6143, SCIC=1600, SCF=FALSE, TID=4800;
ADD N7TKC: MN=23, TG=83, SC=6144, EC=6463, SCIC=1920, SCF=FALSE, TID=5120;
ADD N7TKC: MN=23, TG=83, SC=6464, EC=6783, SCIC=2240, SCF=FALSE, TID=5440;
ADD N7TKC: MN=23, TG=83, SC=6784, EC=7103, SCIC=2560, SCF=FALSE, TID=5760;
ADD N7TKC: MN=23, TG=83, SC=7104, EC=7423, SCIC=2880, SCF=FALSE, TID=6080;
```

6.3.3 Commissioning Guideline

I. Verifying basic functions

Commissioning of the multi-OPC function actually commissions the connection between SoftX3000 and PSTN. For specific commissioning steps, refer to the related contents in Chapter 2 Trunk Signaling Networking of this manual.

II. Verifying whether different OPCs are used normally.

Start the MTP3 tracing program in the interface tracing task on the SoftX3000 client, and then use the telephone to call the user of PSTN switch incessantly. Since the route selection policy of PSTN switch is "percentage selection" and sub-routes 80 and 81 use different OPCs. Therefore, in the ISUP messages sent from SoftX3000 to PSTN switch, different OPCs are used in turn. In this example, the use probability of each OPC is 50%. This phenomenon can be observed through tracing messages.

6.4 Configuring Multi-Area-Code Data

6.4.1 Introduction

I. Requirements

Through software, SoftX3000 can support the multi-area-code function (or multi-country-code) in the same switch, which can well satisfy the operator's requirements on inter-area and inter-nation networking. For example, an operator needs to provide local call access services in cities A, B and C. The application networking is as shown in Figure 6-4.
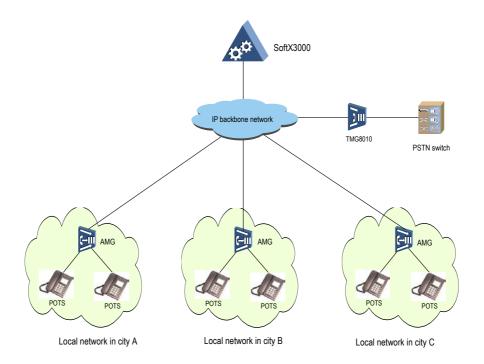
Figure 6-4 Networking for multi-area-code application of SoftX3000

It is required to meet the following requirements by configuring data at SoftX3000 side.

1) The calls among the internal users in the local networks are all local calls, which will be charged in accordance with the charging rate of local network.

2) The calls among the local networks are all toll calls, which will be charged in accordance with the charging rate of toll call.

II. Planning basic data

Only basic data necessary for the configuration is described for simplification purposes. See Table 6-5.

Table 6-5 Planning basic data

Serial No.	Parameter	Value
1	Area code of the local network in city A	0755
2	DN set used in the local network in city A	0
3	Number segment used by the local network in city A	6540000~6540999 8780000~8780999
4	Two call sources are planned in the local network in city A.	Call source codes are 0 and 1.
5	Area code of the local network in city B	0756
6	DN set used in the local network in city B	1

Serial No.	Parameter	Value
7	Number segment used by the local network in city B	3550000~3550999
8	Two call sources are planned in the local network in city B.	Call source code is 10.
9	Area code of the local network in city C	0752
10	DN set used in the local network in city C	2
11	Number segment used by the local network in city C	2820000~2820999 3990000~3990999
12	Two call sources are planned in the local network in city C.	Call source codes are 20 and 21.

Note: The number segments in the local networks can be repeated.

In this example, the relationships among the call source, local DN set and global DN set are shown in Figure 6-5.
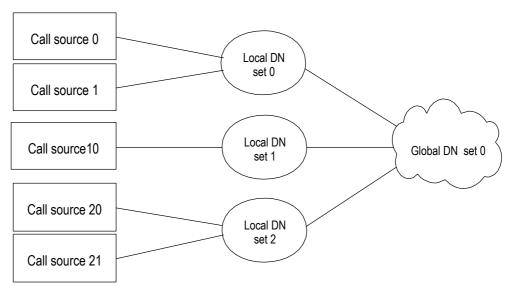
Figure 6-5 Relationships among the call source, local DN set and global DN set

6.4.2 Script

I. Configuring local office data

//Add local DN sets. Set the area code of the local network in city A as 755 and the local DN set as 0. Set the national code of the local network in city B as 756 and the local DN set as 1. Set the area code of the local network in city C as 752 and the local DN set as 2.

```
ADD LDNSET: LP=0, NC=K'86, AC=K'755, LDN="City A";

ADD LDNSET: LP=1, NC=K'86, AC=K'756, LDN="City B";

ADD LDNSET: LP=2, NC=K'86, AC=K'752, LDN="City C";
```

//Add call sources. Call sources 0 and 1 belong to the local DN set 0. Call source 10 belongs to the local DN set 1. Call sources 20 and 21 belong to the local DN set 2.

```
ADD CALLSRC: CSC=0, CSCNAME="City A", PRDN=3, LP=0;

ADD CALLSRC: CSC=1, CSCNAME="City A", PRDN=3, LP=0;

ADD CALLSRC: CSC=10, CSCNAME="City B", PRDN=3, LP=1;

ADD CALLSRC: CSC=20, CSCNAME="City C", PRDN=3, LP=2;

ADD CALLSRC: CSC=21, CSCNAME="City C", PRDN=3, LP=2;
```

//Add number segment (pay attention to the definition of local DN set).

```
ADD DNSEG: LP=0, SDN=K'6540000, EDN=K'6540999;

ADD DNSEG: LP=0, SDN=K'8780000, EDN=K'8780999;

ADD DNSEG: LP=1, SDN=K'3550000, EDN=K'3550999;

ADD DNSEG: LP=2, SDN=K'2820000, EDN=K'2820999;

ADD DNSEG: LP=2, SDN=K'3990000, EDN=K'3990999;
```

II. Configuring subscriber data

//Add the user data of the local network in city A. (Pay attention to the definitions of the local DN set and the call source code.)

```
ADB VSBR: SD=K'6540000, ED=K'6540159, LP=0, MN=22, DID=ESL, EID="amg6540.com",
STID=0, CODEC=PCMA, RCHS=65, CSC=0, NS=CLIP-1;

ADB VSBR: SD=K'8780000, ED=K'8780159, LP=0, MN=22, DID=ESL, EID="amg8780.com",
STID=0, CODEC=PCMA, RCHS=87, CSC=1, NS=CLIP-1;
```

📖 Note:

The call source code of 654000~6540159 is 0 (belong to the local network in city A).The call source code of 878000~8780159 is 1 (belong to the local network in city A).

//Add the user data of the local network in city B. (Pay attention to the definitions of the local DN set and the call source code.)

```
ADB VSBR: SD=K'3550000, ED=K'3550159, LP=1, MN=24, DID=ESL, EID="amg3550.com",
STID=0, CODEC=PCMA, RCHS=35, CSC=10, NS=CLIP-1;
```

📖 **Note:**

The call source code of 355000~3550159 is 10 (belong to the local network in city B).

//Add the user data of the local network in city C. (Pay attention to the definitions of the local DN set and the call source code.)

```
ADB VSBR: SD=K'2820000, ED=K'2820159, LP=2, MN=26, DID=ESL, EID="amg2820.com",
STID=0, CODEC=PCMA, RCHS=28, CSC=20, NS=CLIP-1;
ADB VSBR: SD=K'3990000, ED=K'3990159, LP=2, MN=26, DID=ESL, EID="amg3990.com",
STID=0, CODEC=PCMA, RCHS=39, CSC=21, NS=CLIP-1;
```

📖 **Note:**

The call source code of 282000~2820159 is 20 (belong to the local network in city C).The call source code of 399000~3990159 is 21 (belong to the local network in city C).

III. Configuring number analysis data

//Add the prefixes of the local network in city A, with the local DN set as 0.

```
ADD CNACLD: LP=0, PFX=K'654, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="City
A_654";
ADD CNACLD: LP=0, PFX=K'878, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="City
A_878";
ADD CNACLD: LP=0, PFX=K'0756355, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City B";
ADD CNACLD: LP=0, PFX=K'0752282, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City C ";
ADD CNACLD: LP=0, PFX=K'0752399, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City C";
```

 Note:

- For the called prefixes 654 and 878, the parameter "service attribute" must be set to "local", and the route selection code must be 65535.
- For the called prefixes 0756 and 0752, the parameter "service attribute" in the command must be set to "national toll call", and the route selection code must be 65535.

//Add the prefixes of the local network in city B, with the local DN set as 1.

```
ADD CNACLD: LP=1, PFX=K'355, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="City
B_355";
ADD CNACLD: LP=1, PFX=K'0755654, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City A";
ADD CNACLD: LP=1, PFX=K'0755878, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City A";
ADD CNACLD: LP=1, PFX=K'0752282, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City C";
ADD CNACLD: LP=1, PFX=K'0752399, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City C";
```

 Note:

- For the called prefix 355, the parameter "service attribute" in the command must be set to "local", and the route selection code must be 65535.
- For the called prefixes 0755 and 0752, the parameter "service attribute" in the command must be set to "national toll call", and the route selection code must be 65535.

//Add the prefixes of the local network in city C, with the local DN set as 2.

```
ADD CNACLD: LP=2, PFX=K'282, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="City
C_282";
ADD CNACLD: LP=2, PFX=K'399, MINL=7, MAXL=7, CHSC=0, SDESCRIPTION="City
C_399";
ADD CNACLD: LP=2, PFX=K'0755654, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City A";
ADD CNACLD: LP=2, PFX=K'0755878, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City A";
ADD CNACLD: LP=2, PFX=K'0756, CSA=IDDD, MINL=4, MAXL=24, CHSC=0,
SDESCRIPTION="To City B";
```

📖 **Note:**

- For the called prefixes 282 and 399, the parameter "service attribute" in the command must be set to "local", and the route selection code must be 65535.
- For the called prefixes 0755 and 0756, the parameter "service attribute" in the command must be set to "national toll call", and the route selection code must be 65535.

6.4.3 Commissioning Guideline

The commissioning of multi-area-code function is very simple, therefore only some items requiring attention are described here.
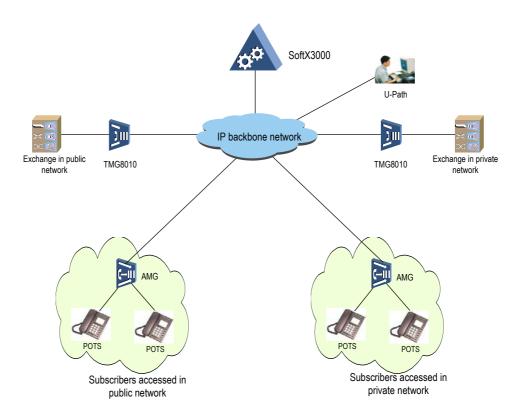
1) If the calls in the local network are abnormal, refer to the relationships demonstrated in Figure 6-5 to check whether the user call source codes and the local DN sets of the intra-office call prefix are correctly configured.
2) If the calls among the local networks are abnormal, use command **LST CNACLD** to check whether the call attributes and the local DN sets of the inter-office call prefix are correctly configured.

6.5 Configuring Data for Blended Application of Public and Private Networks

6.5.1 Introduction

I. Requirements

By using software, SoftX3000 can support the blended application mode of public and private networks in the same office. It means that one office can be logically divided into public network application and private network application. In this way, the operator's requirements on inter-network networking can be satisfied. The networking for this application is as shown in Figure 6-6.

Figure 6-6 Networking for blended application of public and private networks in SoftX3000

It is required to meet the following requirements by configuring data at SoftX3000 side.

1) The subscribers in the public network of the local office are numbered in accordance with the numbering plan of the public network, and the numbers have seven digits. The subscribers in the private network of the local office are numbered in accordance with the numbering plan of the private network, and the numbers have five digits. Among them, some subscribers in the private network may also use the number resources of the public network.

2) When calling other public network subscribers in the local office or in other offices, the public network subscriber in the local office adopts the dialing mode stipulated in the public network. When calling other private network subscribers in the local office or in other offices, the private network subscriber in the local office adopts the dialing mode stipulated in the private network.

3) When calling the public network subscribers, the private network subscriber in the local office must dial "10" before dialing the called number.

4) Under any circumstances, all the subscribers in the local office can dial the emergency numbers like 110, 119, 120, and 122.

5) When the private network subscriber in the local office calls a public network subscriber, if the private network subscriber uses pubic network number resources, the local office will send his/her public network number to the public

network. If the private network subscriber uses no pubic network number resources, the local office will send the unified calling number 2589999 to the public network.

6) When the public network subscriber in the local office or other office calls a private network subscriber in the local office, who uses no pubic network number resources, he/she should first dial the access code 2589999 of the computer console (U-Path). After connection, the U-Path will prompt the subscriber to dial again to reach the called party.

II. Planning basic data

Only basic data necessary for the configuration is described for simplification purposes. See Table 6-6.

Table 6-6 Planning basic data

Serial No.	Parameter	Value
1	Global DN set used by the local office at the public network side	0
2	Signaling point code of this office in the public network	001122 (national network)
3	Area code of the local office in the public network	0755
4	Public network number resources (with seven-digit length) used by the local subscribers	2580000~2589999 2590000~2599999
5	local DN set used by the local office at the private network side	1
6	Signaling point code of this office in the private network	001234 (national reserved network)
7	Area code of the local office in the private network	052
8	Private network number resources (with five-digit length) used by the local subscribers	20000~29999 30000~39999
9	Private network subscribers who uses both private and public network number resources	Private network: 20000~29999 Public network: 2580000~2589999
10	Local DN set used by the public network subscribers in the local office	0
11	Local DN set used by the private network subscribers in the local office	10

Serial No.	Parameter	Value
12	Telephone number of U-Path	Short number: 90000 Long number: 2589999

III. Attention

In this example, assume the U-Path is used to transfer all the incoming traffics to the private network subscribers from the public network. Since U-Path must be located in the Centrex group and the private network subscribers of the local office are not in the Centrex, to enable the U-Path to call the subscribers outside the Centrex, command **ADD CXPFX** can be used to set the service attributes of the intra-Centrex group prefixes "2" and "3" as "emergency outgoing prefix". In this case, the short number of the Centrex group where the U-Path is located cannot be defined as begin with "2" or "3". Suppose it is "9" here.

6.5.2 Script

I. Configuring local office data

//Set local office information. The signaling point codes of the local office are 001122 (national network) and 001234 (national reserved network).

```
SET OFI: OFN="SoftX3000", LOT=CMPX, NN=YES, NN2=YES, SN1=NAT, SN2=NAT2,
NPC="001122", NP2C="001234", NNS=SP24, NN2S=SP24, SPF=YES;
```

📖 **Note:**

Since the local office is situated in the signaling networks of public and private networks, the related information in the local office information table must be defined correctly.

//Add the country/region code, with the global DN set as 1 (used for private network) and the country code as 86.

```
ADD NCODE: P=1, NC=K'86, NN="China";
```

📖 **Note:**

Since the system has automatically configured global DN set 0 during initialization, it needs not be configured again.

//Add area code, with the global DN set as 1.

```
ADD ACODE: P=1, NC=K'86, AC=K'51, AN="City A", DC=0;

ADD ACODE: P=1, NC=K'86, AC=K'52, AN="City B", DC=0;

ADD ACODE: P=1, NC=K'86, AC=K'53, AN="City C", DC=0;

ADD ACODE: P=1, NC=K'86, AC=K'54, AN="City D", DC=0;

ADD ACODE: P=1, NC=K'86, AC=K'55, AN="City E", DC=0;
```

📕 **Note:**

- During the initialization, the system has preset the area code table for the global DN set 0. This table is usually used for public network and need not be configured again.
- All the area codes must be configured for the global DN set 1 according to the area code planning table of the private network. To save the length, the configuration here is only an example.

//Add the description of toll call prefix.

```
ADD PFXTOL: P=0, NC=K'86, NTP=K'0, ITP=K'00;
ADD PFXTOL: P=1, NC=K'86, NTP=K'0, ITP=K'00;
```

//Add local DN sets. The local DN set 0 belongs to the global DN set 0, and the local DN set 10 belongs to the global DN set 1.

```
ADD LDNSET: LP=0, P=0, NC=K'86, AC=K'755, LDN="For PSTN";
ADD LDNSET: LP=10, P=1, NC=K'86, AC=K'52, LDN="For Special";
```

📕 **Note:**

In the example, the parameters global DN set, local DN set, country code and area code in the commands must be correctly defined.

//Add call sources. Call source 0 belongs to the local DN set 0, and call source 10 belongs to the local DN set 10.

```
ADD CALLSRC: CSC=0, CSCNAME="For PSTN", PRDN=3, LP=0;
ADD CALLSRC: CSC=10, CSCNAME="For Special", PRDN=2, LP=10;
```

 Note:

- Call source code 0 is used for the public network subscribers in the local office and the trunks connecting the local office to the public network. The number of pre-collected digits is 3.
- Call source code 10 is used for the private network subscribers in the local office and the trunks connecting the local office to the private network. The number of pre-collected digits is 2.

//Add the number segment (pay attention to the definition of the local DN set).

```
ADD DNSEG: LP=0, SDN=K'2580000, EDN=K'2589999;
ADD DNSEG: LP=0, SDN=K'2590000, EDN=K'2599999;
ADD DNSEG: LP=10, SDN=K'20000, EDN=K'29999;
ADD DNSEG: LP=10, SDN=K'30000, EDN=K'39999;
```

 Note:

Although the private subscribers 20000~29999 also uses the public network number segment 2580000~2589999, since the private network subscribers are universally numbered in five-digit numbers in the local office, the number segment 2580000~2589999 is meaningless in the local office and need not be defined.

II. Configuring subscriber data

//Add subscriber data in the public network (pay attention to the definitions of the local DN set and call source code).

```
ADB VSBR: SD=K'2580000, ED=K'2580159, LP=0, MN=22, DID=ESL, EID="amg2580.com",
STID=0, CODEC=PCMA, RCHS=25, CSC=0, NS=CLIP-1;
ADB VSBR: SD=K'2590000, ED=K'2590159, LP=0, MN=22, DID=ESL, EID="amg2590.com",
STID=0, CODEC=PCMA, RCHS=25, CSC=0, NS=CLIP-1;
```

//Add subscriber data in the private network (pay attention to the definitions of the local DN set and call source code).

```
ADB VSBR: SD=K'20000, ED=K'20159, LP=10, MN=24, DID=ESL, EID="amg20000.com",
STID=0, CODEC=PCMA, RCHS=20, CSC=10, NS=CLIP-1;
ADB VSBR: SD=K'30000, ED=K'30159, LP=10, MN=24, DID=ESL, EID="amg30000.com",
STID=0, CODEC=PCMA, RCHS=30, CSC=10, NS=CLIP-1;
```

📖 **Note:**

In actual application, the call-in and call-out authorities of the private network subscribers should be defined according to actual conditions.

III. Configuring Centrex data (including U-Path)

//Add a Centrex group, with the Centrex group number as 100, outgoing prefix as 10, and subscriber number as 10.

```
ADD CXGRP: CGN="For U-Path", CXG=100, OGP=K'10, DOD2=YES, UCPC=10;
```

//Add intra-Centrex group prefix (short number), with the prefix as 9 and the maximum and minimum number lengths as five digits.

```
ADD ICXPFX: CXG=100, PFX=K'9, CSA=CIG, MINL=5, MAXL=5;
```

📖 **Note:**

To avoid the conflict with the emergency outgoing prefixes 2 and 3, it is recommended to define the prefix used in intra-Centrex group calls as 9. That means to define the short numbers of the Centrex group as begin with 9.

//Add intra-Centrex group (emergency outgoing prefix), with the maximum and minimum number lengths as five digits.

```
ADD ICXPFX: CXG=100, PFX=K'2, CSA=EMCOUT, MINL=5, MAXL=5;
ADD ICXPFX: CXG=100, PFX=K'3, CSA=EMCOUT, MINL=5, MAXL=5;
```

📖 **Note:**

Since prefixes 2 and 3 are used to directly call the subscribers outside the Centrex group, the parameter "service attribute" in the command must be set as "emergency outgoing".

//Set the local IP address used to control the IP console. The IP address is that of the FE interface on IFMI.

```
SET CONADDR: CONLAIP="191.169.150.30";
```

//Add an IP console (U-Path), with the number as 20, registered user name as "group", registration password as "abc123", short number as 9000 and call source code as 0.

```
ADD CXCON: D=K'2589999, MN=22, CONNO=20, IP="191.169.150.20",
CODEC=G711_A-1&G711_U-1&G723_1-1&G729A-1, ACNT="group", PWD="abc123",
CXG=100, CXD=K'90000, RCHS=25, AUT=NRM,
OCR=LCO-0&LC-0&LCT-0&NTT-0&ITT-0&ICTX-1&OCTX-1&INTT-0&IITT-0;
```

Note:

This U-Path is only used for transfer.

IV. Configuring number analysis data (intra-network call)

//Modify the digit map configurations of the local DN sets 0 and 10.

```
MOD LDNSET: LP=0,
DGMAP="[2-8]xxxxxx|13xxxxxxxxx|013xxxxxxxxx|00xxxxxxxxx|010xxxxxxxx|02xxxx
xxxxx|0[3-9]xxxxxxxxx|9xxxx|1[0124-9]x|E|F|x.F|x.L",
MDGMAP="[2-8]xxxxxx|13xxxxxxxxx|013xxxxxxxxx|00xxxxxxxxx|010xxxxxxxx|02xxx
xxxxxx|0[3-9]xxxxxxxxx|9xxxx|1[0124-9]x|*|#|x.#|x.T";
MOD  LDNSET:  LP=10,  DGMAP="[2-8]xxxx|0xxxxx|10xxx|1[124-9]x|E|F|x.F|x.L",
MDGMAP="[2-8]xxxx|0xxxxx|10xxx|1[124-9]x|*|#|x.#|x.T";
```

Note:

In the example, the digit map of local DN set 10 (private network subscriber) is briefly defined. In the deployment of an office, it should be configured according to the operator's dialing plan.

//Add the ordinary prefix in the public network. The local DN set is 0.

```
ADD CNACLD: LP=0, PFX=K'259, MINL=7, MAXL=7, CHSC=65535, SDESCRIPTION="For
259";
ADD  CNACLD:  LP=0,  PFX=K'0,  CSA=NTT,  RSC=0,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="PSTN national toll";
ADD  CNACLD:  LP=0,  PFX=K'00,  CSA=ITT,  RSC=0,  MINL=3,  MAXL=24,  CHSC=0,
SDESCRIPTION="PSTN international toll";
```

 Note:

For the outgoing call prefixes 0 and 00 of the public network, the parameters like local
DN set, route selection code and charging selection code must be correctly configured.

//Add the emergency call prefix of the public network, with the local DN set as 0.

```
ADD CNACLD: PFX=K'110, CSA=LC, RSC=0, MINL=3, MAXL=3, CHSC=110, RCM=CLDC,
ECOS=YES, SDESCRIPTION="For 110";
ADD CNACLD: PFX=K'119, CSA=LC, RSC=0, MINL=3, MAXL=3, CHSC=110, RCM=CLDC,
ECOS=YES, SDESCRIPTION="For 119";
ADD CNACLD: PFX=K'120, CSA=LC, RSC=0, MINL=3, MAXL=3, CHSC=110, RCM=CLDC,
ECOS=YES, SDESCRIPTION="For 120";
ADD CNACLD: PFX=K'122, CSA=LC, RSC=0, MINL=3, MAXL=3, CHSC=110, RCM=CLDC,
ECOS=YES, SDESCRIPTION="For 122";
```

 Note:

- When the local subscriber dials numbers like 110, 119, 120 and 122, the calls are all
  outgoing calls. Therefore, the parameter "route selection code" cannot be set as
  65535. Suppose it is set as 0.
- According to the stipulations, the system does not charge the calls to numbers like
  110, 119, 120 and 122, but records the detailed information. Therefore, the charging
  condition corresponding to the charging selection code 110 must be correctly
  defined (the charging side cannot be "free").
- Generally, calls to 110, 119, 120 and 122 are released under the control of the
  called party. So the parameter "release mode" in the command must be set as
  "called control".
- The parameter "emergency call observation flag" is only used to observe
  emergency call prefix. When a subscriber dials an emergency call prefix, the system
  generates an alarm event of emergency call on the alarm console.

//Add the supplementary signaling, set "emergency call override flag" of such prefixes
as 110, 119 to "Yes".

```
ADD AUSSIG: LP=0, PFX=K'110, CSC=0, ERF=YES;
ADD AUSSIG: LP=0, PFX=K'119, CSC=0, ERF=YES;
ADD AUSSIG: LP=0, PFX=K'120, CSC=0, ERF=YES;
ADD AUSSIG: LP=0, PFX=K'122, CSC=0, ERF=YES;
```

 Note:

To dial such prefixes as 110,119,120,122 in any conditions, the operator must set parameter "emergency call override flag" to "Yes". So even if the maintenance personnel performs operations like parking owing subscriber or restricting call authority, the ordinary subscribers can call numbers like 110.

//Add the ordinary call prefix in the private network, with the local DN set as 10.

```
ADD CNACLD: LP=10, PFX=K'2, MINL=5, MAXL=5, CHSC=65535, SDESCRIPTION="For
2XXXX";
ADD CNACLD: LP=10, PFX=K'3, MINL=5, MAXL=5, CHSC=65535, SDESCRIPTION="For
3XXXX";
ADD CNACLD: LP=10, PFX=K'0, CSA=NTT, RSC=10, MINL=3, MAXL=24, CHSC=10,
SDESCRIPTION="DN national toll";
```

 Note:

For the outgoing call prefix 0 of the private network, the parameters like local DN set, route selection code and charging selection code must be correctly configured.

V. Configuring number analysis data (calls from the public network to the private network)

//Add the ordinary call prefix for the calls from the public network to the private network, with local DN set as 0 and call prefix as 258.

```
ADD CNACLD: LP=0, PFX=K'258, MINL=7, MAXL=7, CHSC=65535, SDESCRIPTION="For
258";
```

 Note:

Since the prefix 258 need to be sent to the number analysis table of global DN set 1 for analysis, the parameter "service attribute" in the command must be set as "local".

//Add number change, with the number change index as 51.

```
ADD DNC: DCX=51, DCT=MOD, DCP=0, DCL=3, ND=K'2;
```

 Note:

This command means that the system changes the original number, and modifies the three digits starting from No. 0 digit to "2".

//Add prefix processing, with the call source code as 0, local DN set as 0, and new global DN set as 1.

```
ADD PFXPRO: CSC=0, LP=0, PFX="258", CCF=YES, NP=1, DDCX=51, ISREANA=YES;
```

 Note:

- For the prefix 258 of the local DN set 0, to realize the called number change function, the parameter "called number change flag" in the command must be set as "YES", and "51" must be input for the parameter "called number change index".
- For the prefix 258 of the local DN set 0, since its parameters like maximum number length, minimum number length, service type and service attribute cannot be used by the public network subscriber to call the private network subscriber, the parameter "whether analyze again" must be set as "YES", and "1" must be input for the parameter "new global DN set".

VI. Configuring number analysis data (calls from private network to public network)

//Add the ordinary call prefix for the calls from the private network to the public network, with local DN set as 10 and call prefix as 10.

```
ADD CNACLD: LP=10, PFX=K'10, MINL=5, MAXL=24, CHSC=65535, SDESCRIPTION="To
PSTN";
```

 Note:

Since the prefix 10 need to be sent to the number analysis table of global DN set 0 for analysis, the parameter "service attribute" in the command must be set as "local".

//Add a supplementary signaling set "emergency call override flag" of such prefixes as 110,119 to "Yes".

```
ADD AUSSIG: LP=10, PFX=K'110, CSC=0, ERF=YES;
ADD AUSSIG: LP=10, PFX=K'119, CSC=0, ERF=YES;
```

```
ADD AUSSIG: LP=10, PFX=K'120, CSC=0, ERF=YES;
ADD AUSSIG: LP=10, PFX=K'122, CSC=0, ERF=YES;
```

//Add an emergency call prefix for the calls from the private network to the public network, with the local DN set as 10.

```
ADD CNACLD: LP=10, PFX=K'110, MINL=3, MAXL=3, CHSC=65535, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 110";
ADD CNACLD: LP=10, PFX=K'119, MINL=3, MAXL=3, CHSC=65535, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 119";
ADD CNACLD: LP=10, PFX=K'120, MINL=3, MAXL=3, CHSC=65535, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 120";
ADD CNACLD: LP=10, PFX=K'122, MINL=3, MAXL=3, CHSC=65535, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 122";
```

📖 Note:

Since the prefixes 110, 119, 120, 122 need to be sent to the number analysis table of global DN set 0 for analysis, the parameter "service attribute" in the command must be set as "local".

//Add number change, with the number change index as 52.

```
ADD DNC: DCX=52, DCT=DEL, DCP=0, DCL=2;
```

📖 Note:

This command means that the system deletes the two digits starting from No. 0 digit.

//Add prefix processing, with the call source code as 10, local DN set as 10 and the new global DN set as 0.

```
ADD PFXPRO: CSC=10, LP=10, PFX="10", CCF=YES, NP=0, DDCX=52, ISREANA=YES;
ADD PFXPRO: CSC=10, LP=10, PFX="110", NP=0, ISREANA=YES;
ADD PFXPRO: CSC=10, LP=10, PFX="119", NP=0, ISREANA=YES;
ADD PFXPRO: CSC=10, LP=10, PFX="120", NP=0, ISREANA=YES;
ADD PFXPRO: CSC=10, LP=10, PFX="122", NP=0, ISREANA=YES;
```

📖 **Note:**

- For the prefix 10 of the local DN set 10, to realize the called number change function, the parameter "called number change flag" in the command must be set as "YES", and "51" must be input for the parameter "called number change index".
- For the prefixes 10, 110, 119, 120 and 122 of the local DN set 10, since their parameters like maximum number length, minimum number length, service type, service attribute, route selection code, charging selection code cannot be used by the private network subscriber to call the public network subscriber, the parameter "whether analyze again" must be set as "YES", and "0" must be input for the parameter "new global DN set".

VII. Configuring number analysis data (calling number analysis when the private network subscriber calls the public network subscriber)

//Add number change, with the number change indexes as 61 and 62.

```
ADD DNC: DCX=61, DCT=MOD, DCP=0, DCL=1, ND=K'258;
ADD DNC: DCX=62, DCT=MOD, DCP=0, DCL=5, ND=K'2589999;
```

📖 **Note:**

- The first command means that the system changes the original number, and modifies No. 0 digit to "258". This change is suitable for the calls to the public network subscribers, which are made by the private network subscribers who uses the public network number resources.
- The second command means that the system changes the original number, and modifies the five digits starting from No. 0 digit to "258999". This change is suitable for the calls to the public network subscribers, which are made by the private network subscribers who do not use the public network number resources.

//Add calling number analysis, with the call source as 10.

```
ADD CNACLR: CSC=10, CID=K'2, PFX=K'10, RDCX=61;
ADD CNACLR: CSC=10, CID=K'2, PFX=K'110, RDCX=61;
ADD CNACLR: CSC=10, CID=K'2, PFX=K'119, RDCX=61;
ADD CNACLR: CSC=10, CID=K'2, PFX=K'120, RDCX=61;
ADD CNACLR: CSC=10, CID=K'2, PFX=K'122, RDCX=61;
ADD CNACLR: CSC=10, CID=K'3, PFX=K'10, RDCX=62;
ADD CNACLR: CSC=10, CID=K'3, PFX=K'110, RDCX=62;
ADD CNACLR: CSC=10, CID=K'3, PFX=K'119, RDCX=62;
```

```
ADD CNACLR: CSC=10, CID=K'3, PFX=K'120, RDCX=62;
ADD CNACLR: CSC=10, CID=K'3, PFX=K'122, RDCX=62;
```

  Note:

- For simplifying purposes, the usage of the above configuration commands can be understood as when a specific calling party dials a specific prefix, the system will perform a specified number change.
- According to the number analysis sequence, SoftX3000 first performs calling number analysis, then prefix processing.

6.5.3 Commissioning Guideline

When SoftX3000 is used in the blended application of public and private networks, the key of the commissioning is the understanding of the number analysis. The following are recommended.

1) First, the parameters like global DN set, local DN set, call source, number segment must be correctly configured. The relationships among the parameters must be correctly defined according to the system data plan.

2) During the configurations of user data and trunk group data, call source must be correctly defined according to the system data plan.

3) The data must be configured according to the actual networking for the subscriber access. The public network subscribers and private network subscribers must be separately commissioned according to the related contents in Chapter 1 Subscriber Access Networking of this manual.

4) The data must be configured according to the actual networking for the trunk signaling network. The trunks connecting the local office to the public network and the private network must be separately commissioned according to the related contents in Chapter 2 Trunk Signaling Networking of this manual.

5) Finally, refer to the guide in this section and configure the corresponding number analysis data, then perform inter-work call commissioning.

6.6 Configuring Emergency Call Prefix Data

6.6.1 Introduction

Usually, the emergency call prefixes refer to the prefixes used in special services, like 110, 119, 120, 122, etc. When theses prefixes are configured, the following requirements must be taken into account.

1) The dialing mode cannot be changed, that means the prefixes like 110, 119 can be dialed directly.

2) Under any circumstances, the subscriber is not restricted by the call-out restriction when dialing such prefixes.

3) The system enables the called party to control the release of such calls.

4) To avoid wrong dialing by mistaken, there is a ringing delay before the called party is connected by the end exchange.

5) If the government specifies service areas for the prefixes like 110 and 119, operator can adopt the calling number analysis to implement the access according to the area. For the related application example, refer to Section 5.3.4 of Chapter 5.

6.6.2 Script

I. Application example 1 (the subscriber of the special service is in the local office)

Requirements: The police center 110 in the local network has 16 branches, and all the branch lines are led out from the local office. The number segment used here is 2820000~2820015. It is required to configure the data at the local office side, so as to ensure the local subscribers can dial 110 at any time, the ringing delay is 3 seconds, and the lines can be selected continuously.

//Add number segment.

```
ADD DNSEG: LP=0, SDN=K'2820000, EDN=K'2820999;
ADD DNSEG: LP=0, SDN=K'100, EDN=K'199;
```

 Note:

To meet the needs for continuous choosing of lines after the subscriber dials the special service number, generally the prefix "110" should be configured as the pilot number of PBX. In this case, a number segment must be configured for the special service prefix.

//Add a PBX subscriber group. The PBX pilot number (also called PBX indicating number) is 110.

```
ADD PBX: GDN=K'110, LP=0, SGM=CYC;
```

  Note:

To realize load sharing among the branches of the 110 center, it is recommended to set the parameter "line selection mode" as "cyclic".

//Add charging data, with the charging type as 300, the paying party as free, and the charging method as in detailed bill.

```
ADD CHGANA: CHA=300, PAY=FREE, CHGT=DETAIL;
```

  Note:

For the special service prefixes like 110, 119, 120 and 122, the charging is made in "detailed bill" mode (in order to get detailed bills). In this case, the "paying party" in this command cannot be set as "free".

//Modify charging modes.

```
MOD CHGMODE: CHA=300, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
MOD CHGMODE: CHA=300, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
MOD CHGMODE: CHA=300, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
```

//Add local group charging, with the charging source code of the calling party as 254 (wildcard), the charging source code of the called party as 110 (suitable for all the branch numbers of the 110 police center).

```
ADD CHGGRP: RCHS=254, DCHS=110, LOAD=ALL, CODEC=ALL, CHA=300;
```

  Note:

This configuration command is mainly used to set all the subscribers of the local office be free of charge when they dial 110.

//Batch-add 16 ESL subscribers, with the appended subscriber type as "PBX subscriber using number resources" and the PBX pilot number as 110.

```
ADB VSBR: SD=K'2820000, ED=K'2820015, LP=0, MN=22, DID=ESL, EID="iad0132.com",
STID=0, CODEC=PCMA, RCHS=110, AUT=PBXD, NS=CLIP-1, GDN=K'110;
```

📖 **Note:**

To meet the requirements that the lines can be selected continuously after the subscriber dials the special service prefix, it is necessary to configure the 16 branches of the 110 police center as PBX subscribers. It means to set the appended subscriber type as "PBX subscriber using number resources" and the PBX pilot number as 110.

//Add a call prefix.

```
ADD CNACLD: PFX=K'110, MINL=3, MAXL=3, CHSC=65535, DP=3, RCM=CLDC, ECOS=YES,
SDESCRIPTION="For 110";
```

📖 **Note:**

- Since all the branch lines of the 110 police center are located in the local office, the parameter "route selection code" in this command must be set as 65535.
- To meet the need that the ringing of the called party is delayed for 3 seconds after the subscriber dials 110, the parameter "ringing delay time" in the command must be set as 3.
- Generally, in the special services like calls to 110, 119, 120 and 122, the calls are released under the control of the called party. Therefore, the parameter "release mode" in the command must be set as "called control".
- The parameter "emergency call observation flag" is only used to observe emergency call prefixes. When a subscriber dials an emergency call prefix, the system generates an alarm event of emergency call on the alarm console.

II. Application example 2 (the subscriber of special service is not in the local office)

Requirements: All the branch lines of the 110 police center in the local network are led out from another exchange. When the subscriber dials 110, the call is transferred by the tandem exchange. It is required to configure the corresponding data at the local office side to meet the needs that the local office subscribers can dial 110 under any circumstances.

//Add charging data, with the charging type as 300, the paying party as free, and the charging method as in detailed bill.

```
ADD CHGANA: CHA=300, PAY=FREE, CHGT=DETAIL;
```

 Note:

For the special service prefixes like 110, 119, 120 and 122, the charging is made in "detailed bill" mode (in order to get detailed bills). In this case, the "paying party" in this command cannot be set as "free".

//Modify charging modes.

```
MOD CHGMODE: CHA=300, DAT=NORMAL, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
MOD CHGMODE: CHA=300, DAT=DTYPE1, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
MOD CHGMODE: CHA=300, DAT=DTYPE2, TS1="00&00", TA1=60, PA1=1, TB1=60, PB1=1,
AGIO1=100, TS2="23&59";
```

//Add destination code charging data, with the charging selection code as 110 and the calling party charging source code as 254 (wildcard).

```
ADD CHGIDX: CHSC=110, RCHS=254, LOAD=ALL, CODEC=ALL, CHA=300;
```

 Note:

This configuration command is mainly used to set all the subscribers of the local office be free of charge when they dial 110.

//Add a call prefix

```
ADD CNACLD: PFX=K'110, CSA=LC, RSC=0, MINL=3, MAXL=3, CHSC=110, RCM=CLDC,
ECOS=YES, SDESCRIPTION="For 110";
```

📖 **Note:**

- When the subscriber dials 110, the call is transferred by the tandem exchange. Therefore, the parameter "route selection code" in the command cannot be set as 65535. Suppose it is set as 0.
- Generally, in the special services like calls to 110, 119, 120 and 122, the calls are released under the control of the called party. Therefore, the parameter "release mode" in the command must be set as "called control".
- The parameter "emergency call observation flag" is only used to observe emergency call prefixes. When a subscriber dials an emergency call prefix, the system generates an alarm event of emergency call on the alarm console.

//Add supplementary signaling, set "emergency call override flag" of 110 prefix to "Yes".

```
ADD AUSSIG: LP=0, PFX=K'110, CSC=0, ERF=YES;
```

📖 **Note:**

To dial such prefixes as 110,119,120,122 in any conditions, the operator must set parameter "emergency call override flag" to "Yes". So even if the maintenance personnel performs operations like parking owing subscriber or restricting call authority, the ordinary subscribers can call numbers like 110.

Appendix A Configuration of Subscriber Terminals

A.1 Pingtel

Pingtel is a multi-media hard terminal supporting SIP. The following configurations are applicable to Pingtel V2.1.8.6 (2003-04-10).

A.1.1 Configuring IP Address of Pingtel Terminal

1) Press the <MORE> button on the upper right corner of the Pingtel terminal. The [Applications] interface is displayed on the telephone screen.

2) Press the first button at the upper right corner of the screen, which corresponds to the item "Prefs" on the screen. The [Preferences] interface is displayed.

3) Press the first button at the upper right corner of the screen, which corresponds to the item "Network Settings" on the screen. Enter the correct password and then press the button corresponding to "OK". The [Network Preferences] interface is displayed.

4) Turn the rotary button on the right side of the Pingtel terminal, and the positions of the configuration items displayed on the screen will change. Set "IP Address" and "Network Mask" to be at the proper positions on the screen.

5) Use the buttons on both sides of the screen to set or modify the related parameters. Here, suppose the configurations are as follows:

- IP Address: 191.169.150.251
- Network Mask: 255.255.255.0

6) After the preceding configurations are completed, the system prompts to restart it. Press the button corresponding to "Restart". The Pingtel terminal restarts to make the configurations valid.

A.1.2 Configuring Data for Interconnection between Pingtel Terminal and SoftX3000

I. Login

1) Set the IP address of the PC to be in the same network segment as that of the Pingtel terminal. Connect the network to ensure that you can log in to the Pingtel terminal interface from the PC with the Ping command.

2) Start Internet Explorer (IE) browser on the PC, and then enter http://191.169.150.251 in the address column to log in to the management interface of the Pingtel terminal.

3) Login username: admin (default). Password: none.

II. Entering the page for configuring telephone information

In the homepage, click [Administration/Phone Configuration], as shown in Figure A-1. The page for configuring telephone information is displayed.
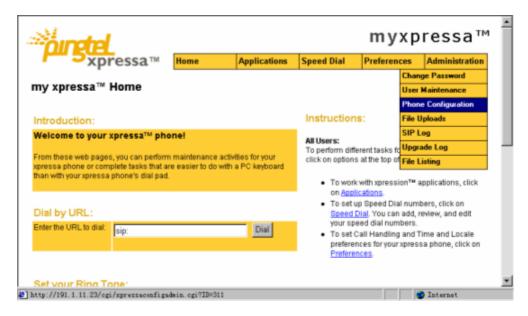
Figure A-1 Homepage

The page for telephone information configuration includes all the information for configuring the Pingtel terminal. Since it is very long and all the information cannot be shown in one screen, you can drag the scroll bar at the right side to select and configure it.

III. Configuring telephone number length

Drag the scroll bar downward until the heading [Call Addressing] appears, as shown in Figure A-2. Select a number length from the [PHONESET_DIALPLAN_LENGTH] box. To facilitate dialing, it is recommended to set it to the length of a local number. Here, it is set to 7.

Call Addressing:

When you make a call, how many digits does the number usually have? For example, a 3-digit extension number, a 7-digit local number, a longer number? *You set this parameter to help the xpressa phone speed up dialing: when you dial a number that is this long, the xpressa phone will automatically dial it (after a short pause). You won't have to press Dial or #.* *(PHONESET_DIALPLAN_LENGTH)*	7 ▾
To set up a digitmap, specify a dial plan and its corresponding SIP address separated by a colon (:). Digitmaps override a simple dial plan length (above). *An example of a digitmap for local phone calls might look like this:* **9xxxxxxx : sip:{digits}@localprovider.net**. *See Installing & Configuring Pingtel Phones for detailed information.* *(PHONESET_DIGITMAP)*	

Figure A-2 Page for configuring telephone number length

IV. Configuring SIP information
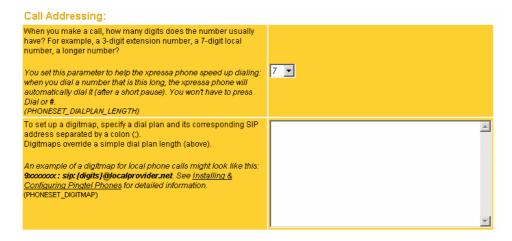
Drag the scroll bar downward until the heading [SIP Servers] appears, as shown in Figure A-3.

1) Enter the IP address of the Directory Server (that is, SoftX3000) in the [SIP_DIRECTORY_SERVERS] box. Suppose it is 191.169.150.30 here.

2) Enter the IP address of the Proxy Server in the [SIP_PROXY_SERVERS] box. Nothing is needed here.

3) Enter the register period of the Pingtel terminal in the [SIP_REGISTER_PERIOD] box. It is recommended to set it to 120 seconds.

4) Enter the TCP port number of the Pingtel terminal in the [SIP_TCP_PORT] box. It should be consistent with the configuration at SoftX3000 side. Here, it is assumed to be 5060.

5) Enter the UDP port number of the Pingtel terminal in the [SIP_UDP_PORT] box. It should be consistent with the configuration at SoftX3000 side. Here, it is assumed to be 5060.

SIP Servers:

Enter the address of the SIP Proxy or Redirect Server that your installation uses to convert dialed numbers into SIP addresses. *Generally, this is entered in the format sip:[domain name].com.* (SIP_DIRECTORY_SERVERS)	191.169.150.30
If all calls must go through a Proxy Server at your installation (similar to a firewall), enter its address here. *Generally, this is entered in the format sip:[domain name].com.* (SIP_PROXY_SERVERS)	
Supply the number of seconds until your xpressa phone's registration with the Registry Server expires. Your phone automatically re-registers itself with each registry server defined for the device or user line(s) before this time period elapses. (SIP_REGISTER_PERIOD)	120
Identify the IP ports on which SIP TCP messages are expected. *Should be set to the same value as SIP_UDP_PORT.* (SIP_TCP_PORT)	5060
Identify the IP ports on which SIP UDP messages are expected. *Should be set to the same value as SIP_TCP_PORT.* (SIP_UDP_PORT)	5060
Enter a number of seconds to pause between sending session reinvite messages during calls. These messages can help track call duration. *All phones participating in a call must support SIP session reinvite for these messages to be sent.* (SIP_SESSION_REINVITE_TIMER)	

Figure A-3 Page for configuring SIP information

V. Configuring authentication information

Drag the scroll bar downward until the heading [Additional Parameters] appears, as shown in Figure A-4.

Additional Parameters:

Enter any additional parameters here. *For all additional parameters, enter the parameter name, then a colon (:), then its value. For example,* **PHONESET_HTTP_PORT: 80**	PHONESET_EXTENSION : 8780001 SIP_AUTHORIZE_PASSWORD.191.169.150.30 : 112233 SIP_AUTHORIZE_USER.191.169.150.30 : 8780001 SIP_REGISTRY_SERVERS : 191.169.150.30

You can also set up identifying device line information for this xpressa phone and optional user lines for the people and entities that use it.

Save   Restart

Figure A-4 Page for configuring authentication information

Enter the following authentication information in the blank column in Figure A-4:

1) PHONESET_EXTENSION: The telephone number of a SIP subscriber. Here, it is assumed to be 8780001.

2) SIP_AUTHORIZE_PASSWORD.191.169.150.30: The registration password of a SIP subscriber. Here, it is assumed to be 112233. "191.169.150.30" refers to the IP address of the SIP call server (that is, SoftX3000), which must be set correctly.

3) SIP_AUTHORIZE_USER.191.169.150.30: The registration name of a SIP subscriber. Here, it is assumed to be 8780001. "191.169.150.30" refers to the IP address of the SIP call server (that is, SoftX3000), which must be set correctly.

4) SIP_REGISTRY_SERVERS: The IP address of the SIP registration server (that is, SoftX3000). Here, it is assumed to be 191.169.150.30.

VI. Configuring SIP URL information

1) Click the link <device line> in Figure A-4. The page for configuring SIP URL information is displayed, as shown in Figure A-5.

Figure A-5 Page for configuring SIP URL information

2) There are two configuration options for SIP URL: Device Line and User Lines. Click the link <Add New Line> or <Edit>. The page [Enter Line Information] is displayed, as shown in Figure A-6.
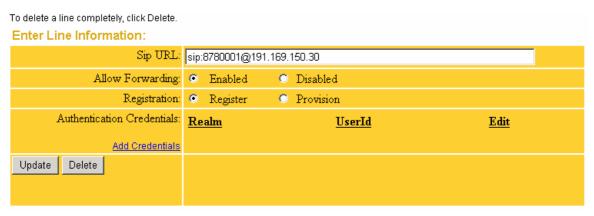

Figure A-6 Page for configuring SIP URL information

3) Enter SIP URL information in the [Sip URL] box in the format of "**sip:**telephone number of a SIP subscriber**@**IP address of SIP registration server". Here, it is assumed to be "sip:8780001@191.169.150.30". After the setting, click <Update>.

4) The system returns to the page as shown in Figure A-5. Click <Save>.

VII. Saving configuration and resetting

After all the configurations are completed, click <Administration/Phone Configuration> to enter the page for configuring telephone information again. Click <Save> to save the configuration, and then click <Restart> to reset the Pingtel terminal.

A.2 Vizufon 4500

Vizufon 4500 is a multi-media hard terminal supporting H.323 protocol (fast start version). The following configurations are applicable to Vizufon V1.2 (2003-11-14).

A.2.1 Configuring IP Address of Vizufon Terminal

1) Press the <ENT> button on the bottom right corner of the Vizufon terminal. The configuration menu is displayed on the telephone screen.

2) Press the leftward or rightward arrow button on the dialer to select the <IP> icon, and then press the <ENT> button. Enter the correct password as prompted by the system, and then press <ENT>. The IP configuration interface is displayed on the screen.

3) Press the upward or downward arrow button on the dialer to select the first item "Default Setting", and then press <ENT>. The Internet configuration interface is displayed on the screen.

4) Press the upward or downward arrow button to select a configuration sub-item and then press the rightward or leftward arrow button to enter the mode for setting parameters or numbers. Here, suppose the configurations are as follows:

- Type: LAN (Static IP)
- IP address: 191.169.150.252
- Sub. Mask: 255.255.255.0
- Gateway: 191.169.150.1
- DNS address: 0.0.0.0

5) After finishing the preceding configurations, press the <EXIT> button to exit the system. The system prompts "IP setting has been reconfigured. Save and apply new setting?" Press the button corresponding to "YES". The vizufon terminal will restart to make the configurations valid.

A.2.2 Configuring Data for Interconnection between Vizufon Terminal and SoftX3000

1) Press the <ENT> button on the bottom right corner of the Vizufon terminal. The configuration menu is displayed on the telephone screen.

2) Press the leftward or rightward arrow button on the dialer to select the <IP> icon, and the press the <ENT> button. Enter the correct password as prompted by the system, and then press <ENT>. The IP configuration interface is displayed on the screen.

3) Press the upward or downward arrow button on the dialer to select the second item "Advanced Setting", and then press the <ENT> button. The IP call setting interface is displayed on the screen.

4) Press the upward or downward arrow button to select a configuration sub-item and then press the rightward or leftward arrow button to enter the mode for setting parameters or numbers. Here, suppose the configurations are as follows:

- GK address (that is, IP address of the master home SoftX3000): 191.169.150.30
- H.323 ID (that is, equipment ID of the H.323 terminal): 8780011
- E.164 (that is, telephone number of the H.323 terminal): 8780011
- Password (that is, the registration password of the H.323 terminal):
- GK address 2 (that is, IP address of the slave home SoftX3000):

5) After finishing the preceding configurations, press the <EXIT> button to exit the system. The system prompts "IP setting has been reconfigured. Save and apply new setting?" Press the button corresponding to "YES". The Vizufon terminal will restart to make the configurations valid.

A.3 ViewPoint 8220

ViewPoint 8220 is a multi-media hard terminal supporting H.323. The configuration method described here is applicable to V600R420 B02D011 or higher.

A.3.1 Configuring IP Address of ViewPoint 8220

I. Entering main menu

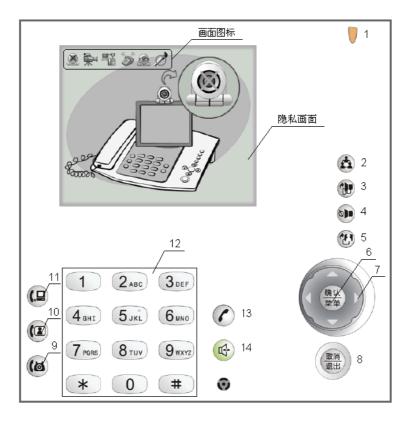Press the key <Confirm/Menu> (indicated by 6 in the Figure A-7) on the operation panel to enter the main menu.

Figure A-7 Operation panel of ViewPoint 8220

II. Setting IP address

Select [Network Settings] in the main menu, and then set the related parameters according to the mode of obtaining IP address, as shown in Figure A-8.
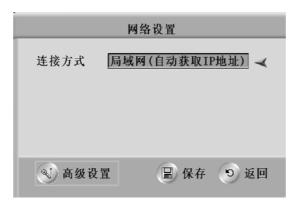

Figure A-8 [Network Settings] interface

- If the connection mode is ADSL dialup (PPPoE dialup) or LAN (PPPoE dialup), dialup account and password need be set.
- If the connection mode is ADSL dedicated line or LAN (fixed IP address), it is necessary to set IP address, subnet mask, gateway address, and DNS address. (If there is no DNS address, set it to "100.100.100.100".)

III. Saving the configuration

To save the configuration, press the direction keys on the operation panel to select <Save> in the interface as shown in Figure A-8, and then press the key <Confirm/Menu> on the operation panel.

A.3.2 Configuring Data for Interconnection between ViewPoint 8220 and SoftX3000

I. Setting basic information

1) Select [User Settings] on the main menu, and then set the IP address of the registration server, account, and password, as shown in Figure A-9.

Figure A-9 [User Settings] interface

2) Enter the IP address of the GK (that is, SoftX3000) in the [Server address] box, for example, 10.10.10.10.
3) Enter the equipment ID of the H.323 terminal (ViewPoint 8220) in the [Number] box.
4) Enter the password of the H.323 terminal (ViewPoint 8220) in the [Password] box.
5) Enter the name of a place or a person in the [Nickname] box and this name will be displayed in the conference list.

II. Saving the configuration

To save the configuration, press the direction keys on the operation panel to select <Save> in the interface as shown in Figure A-9, and then press the key <Confirm/Menu> on the operation panel. After ViewPoint 8220 is reset, it can log in to SoftX3000.

A.4 OpenEye

OpenEye is a multi-media soft terminal supporting either SIP or H.323. The following configurations are applicable to OpenEye Release 3.11.1 (or later).

A.4.1 OpenEye Supporting SIP

Click [Programs/ViewPoint OpenEye/ViewPoint OpenEye] on the Windows desktop to display the OpenEye interface.

1) Enter the IP address of the registration server (that is, SoftX3000) in the [Registration server] box. Here, it is supposed to be 191.169.150.30.

2) Enter the IP address of the call server (that is, SoftX3000) in the [Call server] box. Here, it is supposed to be 191.169.150.30.

3) Enter the equipment ID of the SIP subscriber (that is, OpenEye terminal) in the [User ID] box. Here, it is supposed to be 8780003.

4) Enter the registration password of the SIP subscriber (that is, OpenEye terminal) in the [Password] box. Here, it is supposed to be 112233. If you do not want to enter the password for every login, you can select the checkbox [Save].

5) Leave the two boxes [Card number] and [Password] blank generally.

6) Enter the telephone number of the SIP subscriber (that is, OpenEye terminal) in the [Number] box. Here, it is supposed to be 8780003.

7) Upon finishing the preceding configurations, click <OK> to save the configuration information. After OpenEye is reset, you can log in to SoftX3000 from it.

A.4.2 OpenEye Supporting H.323

Click [Programs/ViewPoint OpenEye/ViewPoint OpenEye] on the Windows desktop to display the OpenEye interface.

1) Enter the IP address of the GK (that is, SoftX3000) in the [Server address] box. Here, it is supposed to be 191.169.150.30.

2) Enter the equipment ID of the H.323 subscriber (that is, OpenEye terminal) in the [User ID] box. Here, it is supposed to be 8780013.

3) Enter the registration password of the H.323 subscriber (that is, OpenEye terminal) in the [Password] box. Here, it is supposed to be 556677.

4) Enter the telephone number of the H.323 subscriber (that is, OpenEye terminal) in the [Nickname] box. Here, it is supposed to be 8780013.

5) Upon finishing the preceding configurations, click <OK> to save the configuration information. After reset, OpenEye can log in to SoftX3000. After OpenEye is reset, you can log in to SoftX3000 from it.

Appendix B Acronyms and Abbreviations

Abbreviation	Full name
A	
AAA	Authentication Authorization and Accounting
ACC	Account Card Calling
AMG	Access Media Gateway
AN	Access Network
ASN.1	Abstract Syntax Notation One
B	
BAM	Back Administration Module
BFII	Back insert FE Interface Unit
BITS	Building Integrated Timing Supply
BRA	Basic Rate Access
BSGI	Broadband Signaling Gateway
C	
CAMA	Centralized Automatic Message Accounting
CCF	Call Control Function
CDBI	Central Database Board
CDR	Call Detail Record
Centrex	Central Office Exchange Service
CIC	Circuit Identification Code
CID	Caller Identification Display
CKII	Clock Interface Unit
CODEC	Coder-decoder
CPC	Central Processing Board
D	
DDI	Direct-Dialing-In
DOD2	Direct Outward Dialing-2
DPC	Destination Point Code
DSS1	Digital Subscriber Signaling No.1
DTMF	Dual-Tone Multifrequency

Abbreviation	Full name
E	
EC	Echo Canceller
ENUM	E.164 Number URI Mapping
EPII	E1_Pool Interface Unit
F	
FCCU	Fixed Calling Control Unit
FCSU	Fixed Calling Control Unit and Signaling process Unit
FE	Fast Ethernet
FPH	Free Phone
FSK	Frequency Shift Keying
G	
GK	Gatekeeper
GT	Global Title
GW	GateWay
I	
IAD	Integrated Access Device
iDo	ViewPoint iDo
IFMI	IP Forward Module
iGWB	iGateWay Bill
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
IP	Internet Protocol
IPN	Internet Personal Number
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
IUA	ISDN Q.921-User Adaptation Layer
IVR	Interactive Voice Response
M	
M2PA	MTP2-User Peer-to-Peer Adaptation Layer
M2UA	Message Transfer Part 2 (MTP2) -User Adaptation Layer
M3UA	Message Transfer Part 3 (MTP3) -User Adaptation Layer

Abbreviation	Full name
MAC	Media Access Control
MCU	Multipoint Control Unit
MG	Media Gateway
MGC	Media Gateway Controller
MGCP	Media Gateway Control Protocol
MIDCOM	Middlebox Communications
MML	Man Machine Language
MRCA	Media Resource Control Unit
MRIA	Media Resource Interface Unit
MRS	Media Resource Server
MSGI	Multimedia Signaling Gateway Unit
MTA	Media Terminal Adapter
MTP	Message Transfer Part
N	
NAT	Network Address Translation
NCS	Network-based Call Signaling
NGN	Next Generation Network
NMS	Network management System
NP	Number Portability
O	
OAM	Operation Administration and Maintenance
OPC	Originating Point Code
P	
PAP	Password Authentication Protocol
PBX	Private Branch Exchange
PDB	Power Distribution Box
PRA	Primary Rate Access
POTS	Plain Old Telephone Service
PPS	Pre-Paid Service
PSTN	Public Switched Telephone Network
R	
RADIUS	Remote Authentication Dial-In User Service
RAS	Registration, Admission and Status

Abbreviation	Full name
RTCP	Real-time Transport Control Protocol
RTP	Real-time Transport Protocol
S	
SAU	Signaling Access Unit
SCCP	Signaling Connection Control Part
SCN	Switched Circuit Network
SCP	Service Control Point
SCTP	Stream Control Transmission Protocol
SDH	Synchronous Digital Hierarchy
SDP	Service Data Point
SG	Signaling Gateway
SIGTRAN	Signaling Transport
SIP	Session Initiation Protocol
SIUI	System Interface Unit
SLC	Signaling Link Code
SLS	Signaling Link Selection Code
SMAP	Service Management Access Point
SMP	Service Management Point
SMS	Service Management System
SNMP	Simple Network Management Protocol
SP	Signaling Point
SS7	Signaling System No.7
SSN	Sub-System Number
SSP	Service Switching Point
STP	Signaling Transfer Point
STUN	Simple Traversal of UDP Through Network Address Translators
T	
TCAP	Transaction Capabilities Application Part
TCP	Transport Control Protocol
TDM	Time Division Multiplex(ing)
TMG	Trunk Media Gateway
TRIP	Telephone Route Information Protocol
U	

Abbreviation	Full name
UDP	User Datagram Protocol
UMG	Universal Media Gateway
UNI	User Network Interface
U-NICA	Universal Network Intelligent Core Architecture
UPT	Universal Personal Telecommunication
U-SYS	You Design Your System
V	
V5UA	V5.2-User Adaptation Layer
VoIP	Voice Over IP
VOT	Televoting
VPN	Virtual Private Network
URL	Uniform Resource Locators
W	
WAC	Wide Area Centrex
WWW	World Wide Web
X	
xDSL	x Digital Subscriber Line
XML	Extensible Markup Language